ew Remedies and Therapeutic Measures.

WALTWRIGHT.

A Syllabus of

New Remedies and Therapeutic Measures

With Chemistry, Physical Appearance and Therapeutic Application.

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PREFACE.

I will admit the science of chemistry to be an exact science, mathematically determined; that a chemical, if pure, is identical with every similar product without regard to its source. I will grant that operative surgery is susceptible of predetermined results; that the study of obstetrics has in the main become a science; that a knowledge of optics entails an acquaintance with laws upon which all agree and which do not vary; that all specialties in medicine are governed by a routine procedure which has but little variation.

I will with equal boldness maintain that the part of the practice of medicine which brings to the physician success; that enables him to meet his obligations; that extends the boundaries of his domain and holds fast his clientele, is the least understood of all branches of medicine. I refer to Pharmacology, or the science of medicines, their nature, administration and effects.

Synthetic chemistry has added many new remedies to the physicians' armamentarium, and the knowledge of these becomes day by day more extended as their application is better understood, but the curricula in our schools do not include them; many otherwise admirable books ignore them, and thus force the progressive practitioner to accept interested literature or the statements of, usually, non-professional men.

It may be asked from what source can one obtain authoritative and disinterested information regarding these products. There can be but one answer: from the published clinical reports appearing in medical literature, mostly journals, from time to time. Yes! but the busy practitioner or student does not have the opportunity, time or means to consult this great num-

ber of journals or works, nor to condense the information therein contained, into a compass sufficiently brief, yet comprehensive, to furnish him with the practical or useful part.

It has been the aim of the author to do this conscientiously, accurately, and with due regard to the wants of the busy man. The articles treated of are few when compared with the multitude which are offered the profession, and only those, therefore, which have passed the experimental stage, which have become necessary ones, are included. Further, only those products whose chemistry is known, or whose exact formula are given, appear.

Therapeutic measures other than those coming from the laboratory are also treated of, as a number of them have a most important place in the therapeutics of to-day.

Obligations being so numerous, I will not attempt to name them here, as they appear in the body of the book.

J. W. W.

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ACETANILID.

$C_6H_5NH.COCH_3$.

An acetyl derivative of anilin which is prepared by the action of glacial acetic acid on anilin. It occurs in white shining crystals, which are odorless, with a slightly burning taste. It is only slightly soluble in cold water, rather freely so in boiling water, and in alcohol. A solution of acetanilid should be neutral.

It is said to be somewhat germicidal, inhibiting the growth of pathogenic micro-organisms. Its action is more powerful than that of antypyrin the dose being 0.2-0.5 gm. (3-7½ gr.) It is analgesic when applied to exposed nerve terminals in wounds or ulcers; is used in continued fevers, decreasing heat production, but spending its force more upon the heat producing centres than upon those of heat dissipation. It also acts as a nerve sedative, affecting both motor and sensory nervous systems. It is frequently useful in influenza, in suppuration of the middle ear when applied in very fine powder.

Acetanilid has been used in surgery, also as an antiseptic dressing on chancres and

chancroids, in cervical erosions and in leucorrhea. Great care should be taken in its external application, however, more especially in its application to children, as a number of cases have lately been reported where there has resulted cyanosis, weak and rapid pulse, dilated pupils and collapse, followed in some instances by death. These effects have followed application to unbroken surfaces as well as to ulcers, burns, circumcision and to the umbilical stump after detachment of the cord.

As an analgesic, anesthetic and hemotinic, acetanilid is inferior to antipyrin. It should not be prescribed with spirit niter, nor with antipyrin, the alkali bromids or iodids. There are a number of secret preparations offered whose active principle is acetanilid. The "headache powders" so freely sold depend largely upon this drug for their analgesic effect.

ACOINE.

Acoine is a complex body being described as Di-para-anisyl-mono-phenetol-quanidin hy-

drochlorate, and has been recommended (by Carter, in Lancet) as a local anesthetic in place of cocain. It is said to be less toxic than cocain, and without effect upon the accommodation when used in the eye.

Dr. Randolph in the Ophthalmic Record reports it inferior to either holocain or cocain. When there was congestion or irritation satisfactory anesthesia was not secured.

ACTOL.

(Silver Lactate.)

$AgC_3H_5O_3+H_2O$.

Actol occurs as a white inodorous powder which is soluble in water.

This is one of the numerous silver salts and is used as a surgical antiseptic. A solution of 1-1000 is said to destroy pathogenic bacteria within 5 minutes. It has also been used in hypodermic injection in erysipelas, 0.3 gm. in 100 ccm. of water, and as a wash teaspoonful of solution 1.50 in a glass of water.

AIROL.

Bismuth oxyiodogallate.

$C_6H_2(OH)_3COO(BiOHI)$.

One of the very numerous substitutes for iodoform occurring as a greyish, tasteless and odorless powder. Its use is limited to external applications whenever iodoform is indicated. It is said to be as active an antiseptic as iodoform, and as it produces no pain or irritation with the further advantage of being odorless, its field of usefulness might be expected to be large, but in fact the reverse is true.

Airol has received much favorable notice in German medical literature during the past few years, and seems to be extensively used in that country; but in the United States little if any notice has been taken of it, due probably to lack of commercial push.

It is best used as a sprinkling powder, and rapidly influences the secretion. It may be prescribed with glycerin, but water causes its rapid decomposition.

ALUMNOL.

Beta-naphtol-disulphonate of Aluminum.

$$[C_{10}H_5(OH)(SO_3)_2]_3Al_2.$$

A fine, white powder, odorless, easily soluble in cold water and glycerin, less in alcohol and insoluble in ether.

Possesses the properties of its constituents, the acid and base, antiseptic and astringent; owing to its special property of dissolving in pus, it has a more penetrating action into the tissues than other agents and facilitates disinfection of purulent surfaces and cavities. Introduced about ten years ago it quickly became a favorite in surgical, otiatric, gynecological and dermatological practice, and has maintained its place as a useful and preferred therapeutic agent in indicated cases.

Recommended in 1 per cent solution for gonorrhea in males, and in 2 to 5 per cent suppositories for females; in 10 per cent solutions as caustic for abscesses, etc.; in 1 to 5 per cent solutions for irrigation in leucorrhea; in 2 to 5 per cent bougies; also in ointments, plasters, etc.; and in 10 to 20 per cent mixture with talcum as a dusting powder.

The earliest reports showed its favorable

action in endometritis gonorrhoica (Heinz and Liebrecht, Asch, Chotzen), in otitis media purulenta (Briger), for cleansing the eyes in blennorrhea (Wolffberg), etc. Stepanicz found that after the inhalation of a 1 per cent solution in acute laryngeal affections the roughness of voice disappeared, and the same solution rendered signal service as a hemostatic in hemoptysis. In acne rosacea good results were reported by Gottheil (Sajous Annual 1898). Cantrell reported successes in acute and chronic inflammatory, syphilitic and parasitic affections. (Coll. and Clin. Record, and American Therap., 1894). Vansant arrested nasal hemorrhage with a 10 per cent Alumnol plug (Phila. Med. Journal, 1899).

AMYLEN-CHLORAL.

(Dormiol.)

(Dimethyl-ethyl-carbinol-chloral.)

Amylen-chloral or dormiol is an oily liquid of camphoraceous odor prepared first by Fuchs, by the fusion together in molecular proportions of amylen hydrate and chloral hydrate.

Being soluble in water only after prolonged contact, Fuchs, who named the product dormiol, believed that as an hypnotic it would prove safer than chloral in that it would be more slowly absorbed and, in the circulation, only slowly split up into its components.

Experiments on animals seem to have established the fact that chloral in this form is borne in larger quantities than as chloral hydrate. Meltzer's investigations demonstrated that dormiol is a safe hypnotic, producing in doses of 0.5-2.0 gm. (7½-30 gr.) prompt and dreamless sleep. He found dormiol less depressant to the heart than chloral hydrate but he was not convinced of any other marked superiority. Amylen-chloral is apparently free from unpleasant by or after-effects. It has been especially commended as an hypnotic for the insane.

AMYLEN-HYDRATE.

(Dimethyl-ethyl-carbinol, Tertiary Amyl-alcohol.)

$C_5H_{12}O$.

Amylen-hydrate is a heavy liquid, colorless,

with a mint odor and soluble in 10 parts of water.

Hypnotic, in 2.0-4.0 gm. (30-60 min.) doses, administered in aqueous solutions or plain in wine or beer. Also recommended in 0.18-0.30 ccm. (3-5 min.) doses, in water with raspberry syrup, in whooping cough.

As a hypnotic it is extensively used in Europe, but not much in this country. It is deemed safe and efficient, and superior to paraldehyd (while also devoid of the offensive odor of the latter).

First introduced by von Mering, and favorably reported on by Mayer, Naecke, Wildermuth, and others.

Amylen-hydrate is not an analgesic and therefore is without effect as a hypnotic when there is pain.

ANALGEN.

(Quinalgen.)

(Ortho-ethoxy-ana-mono-benzoyl-amido chinolin.)

$C_{18}H_{16}N_2O_2$.

Analgen is a colorless crystal, insoluble in

water, but soluble in alcohol, melting at 208 deg. C. (406.4°F.)

It has been used as an antipyretic, analgesic and antirheumatic, but reports of its depressing action upon the heart, causing in some instances convulsions and paralysis with nausea, vomiting, diarrhea, tremor, vertigo and rashes has limited its use. It is said to have also a destructive action on the red blood corpuscles, resulting in urobilinuria.

Analgen, after a brief career in this country, was re-introduced as Quinalgen, and reports have been more favorable. H. S. Green (Memphis Med. Monthly, Feb., 1900) confirms the opinion of Moncorvo as to its value in chorea. Servoss (Medical Council, Oct., 1899) reports a satisfactory experience with this remedy in malaria, as does also A. M. Wilson in Kansas City Medical Index-Lancet, May, 1900.

The statement is made that the reddish hue appearing in the urine of those using quinalgen is not due to the presence of blood coloring matter, but to a chemical combination between quinalgen and certain urinary constituents, and that this change in color of the urine can be prevented by administering alkalies.

Quinalgen (analgen) is given in tertian and quartan intermittent fevers in doses of 1.0-1.296 gm. (15-20 gr.), 8-10 hours before an attack is expected; this, it is reported, preventing the attack, or causing it to be greatly modified.

Analgen, by the way, is a name also appropriated by a firm of manufacturing pharmacists for a mixture of acetanilid, etc., and the two products must not be mistaken one for the other, as the dosage varies and serious trouble might result from an error in dispensing.

ANESTHESIA, LOCAL AND REGIONAL.

The benumbing effect of cold upon the sensory nerves ending in the skin and organs has been known for a long time, and surgeons have adopted various expedients to produce this condition of comparative or complete analgesia by refrigerating applications, such as ice or snow with salt, the evaporation of ether-spray, rhigolene, or of chlorid of ethyl and similar agents.

When Dr. Alexander Wood, of Edinburgh,

introduced the system of hypodermic medication, in 1848, he called attention to the fact that when morphin is injected under the skin, the anodyne and sedative effects of the remedy are most marked in the immediate neighborhood. He recommended, therefore, that, in the treatment of neuralgia, the hypodermic injection should be made near to the point of greatest tenderness and pain. The possibility of inducing local anesthesia for surgical operations by this means apparently escaped the notice of general surgeons, although the suggestion was, to some extent, adopted for the purpose of relieving pain during extraction of teeth. However, soon after the publication of Koller's discovery (in 1884) of the power of cocain to reduce or to temporarily abolish sensation, surgeons began to use this agent in order to produce local anesthesia for surgical operations, especially those of a minor character. In the case of mucous membranes, it was found to be necessary merely to bring the cocain solution (2 to 4 per cent generally), in immediate contact with the surface and allow it to remain a few minutes, in order to produce local insensibility to pain. Upon other parts of the body, the hypodermic method was adopt-

ed, in order to bring the solution in contact with the papillary layer of the skin. By the use of certain devices to exercise compressure and to shut off the capillary circulation of the area to be operated upon, it was found that larger quantities of cocain could be used without causing toxic effects and complete local anesthesia obtained. By adopting this expedient, Dr. J. Leonard Corning, of New York, and others, performed a large number of major operations, such as removal of tumors, extirpation of the mammary gland, and amputation of limbs. A number of accidents resulted from the large quantity of cocain thus employed, and several deaths were reported, so that this method soon fell into disrepute. In 1894, Dr. Schleich, of Vienna, devised a method of "infiltration anesthesia," by which the same results were obtained, but with much smaller quantities of the drug, so that there is little or no systemic effect. Schleich recommended three solutions:

SCHLEICH'S INFILTRATION ANESTHESIA.

No. 1—For strongly hyperesthetic regions (as in inflammation, suppuration, and neuralgia):

Strong solution:

Cocain hydrochlorid	1. Gm.
Cocain phosphate	.06
Sodium chlorid	.6
Distilled water	100.
Phenol (4 per cent).....	2 drops

No. 2—For moderately hyperesthetic regions:

Normal Solution:

Cocain hydrochlorid	.05 Gm.
Cocain phosphate	.06
Sodium chlorid	.6
Distilled water	100.
Phenol (5 per cent).....	2 drops

No. 3—For prolonged operations:

Weak solution:

Cocain hydrochlorid	.01
Morphin hydrochlorid	.005
Sodium chlorid	.2
Distilled water	100.
Phenol (5 per cent).....	2 drops

The strong solution may be used as per formula, but is usually diluted 3 or 4 times with normal salt solution. The quantity of cocain is a matter of great importance. Not more than .02 gm. (gr. 1-3) should be introduced at one sitting, under the skin, as fatal results have been reported from larger quantities.

The method of Schleich is to infiltrate the deeper layers of the skin, by the injection of sufficient solution to produce a small elevation, of the surface of circular outline, a series of punctures being made at definite intervals, so as to indicate the line of incision, each puncture being made within the area of infiltration of the preceding puncture, pushing the needle almost horizontally forward under the skin, so as to cause overlapping of the edges of the successive swellings, and continuing until the desired area is anesthetized and the incision outlined. The operation is then conducted as under ordinary ether or chloroform anesthesia, but with the advantage of having the patient conscious, though feeling no pain. In cases where the skin is hyperesthetic and unable to tolerate the puncture of the needle and the pressure of the solution, the procedure may be preceded by the local application of cold to reduce sensibility of the part, or a small hypodermic injection of morphin may be given at the location chosen for the commencement of the series of infiltration punctures. Schleich prefers to freeze the spot with ethyl chlorid spray.

As the following injections are made within the area of the next preceding, they are not

painful. This method of infiltration anesthesia is useful especially for minor operations, such as opening abscesses; making incisions to remove foreign bodies, or small tumors; the reduction of strangulated hernia and the operation for the radical cure of hernia; amputation of fingers; operation for relief, or removal, of ingrown toe-nail, tracheotomy, and even celiotomy.

Schleich; Aertze Rundschau, 1894.
Wurdeman, Journal Am. Med. Ass'n, Dec., 1894.
Weller van Hook, Medical News, Nov. 16, 1895.
Gould, American Hand-Book of Med. and Surg., 1897.

DIRECT ANESTHETIZATION OF NERVES.

Krogius of Helsingfors (Centralblatt fur Chirurgie) has called attention to the fact that if the cocain solution be injected near a nerve trunk, analgesia will be produced in the peripheral distribution of the nerve. He employs a 2 per cent solution, injecting it at the elbow over the ulnar nerve, for instance, for operations upon the hand and forearm. An injection at the proximal end of a finger produces complete analgesia of the entire digit, of all the tissues deep and superficial. The effect is produced in five minutes, and continues for fifteen, or more. A large number of operations

performed by this method, comprising amputation of fingers and toes, circumcision, etc., have demonstrated its practicability and usefulness.

Dr. Bransford Lewis (Va. Med. Monthly, Feb., 1896) has suggested some modifications of the technique of Schleich's method and has devised special needles and syringes. The anesthesia is begun by the use of sharp needles of steel, as usual, but is continued by blunt needles of German silver, which are larger and considerably longer. These can be pushed about in various directions through the connective tissue after the skin has been cut to permit their introduction, but they will not penetrate the vessels.

Dr. Rudolph Matas of New Orleans (Phil. Med. Journal, Nov. 3, 1900), in a very comprehensive and satisfactory review of the subject, describes a mixed method for operation upon the fingers, toes and metacarpals, and also the hand, wrist and forearm. For the digits and metacarpals, he employs the infiltration method, combined with para-neural injections (using Schleich's 1-5 of 1 per cent, or a 1 per cent solution, according to sensitiveness and extent of area). For the hand and forearm, in thin and wasted subjects, the infiltration method

alone is employed, applied like a bracelet circumferentially around the limb. This may have combined with it, para-neural (subcutaneous) injections in the region of the nerve tracts, at the wrist and elbow. Matas prefers the direct intraneural method, especially in stout subjects. In order to abolish superficial sensibility in the forearm, for instance, a dermo-hypodermal infiltration is caused around the arm, above the elbow, or on a level with the neural injections. The arm is then exsanguinated by elevation and a constrictor is placed at the axillary level. Three incisions are then made to expose the musculospiral, the ulmar, and the median nerves. Each nerve is then injected separately with the anesthetizing solution (5 to 8 minims of 1 per cent cocain solution). The anesthesia is complete from fingertips to the elbow. He reports an amputation by this method, with complete success, of part of the hand, for epithelioma, in a man seventy-six years of age, with disease of heart and blood vessels.

By pursuing the neuro-regional infiltration in a similar manner, in the lower extremity, a number of amputations and other major operations have been very successfully done by Dr.

Matas, also by Dr. George W. Crile, of Cincinnati, and others.

In the Lancet for January 20, 1900, Dr. Arthur E. Barker reports the results of his recent experience with eucain B, as a substitute for cocain for producing local anesthesia. He employed eucain B in a saline solution, in the strength of 1 to 1,000. In long operations, as much as five or six ounces was injected without any ill effect in any instance. The cases best suited for this form of local anesthesia are those in which the condition of the lungs, heart or kidneys is such as to make general anesthesia by ether or chloroform inadvisable. Barker regards it as not suited, generally speaking, to most children and to nervous or timid adults. He reports 53 extensive operations under eucain anesthesia, including the radical cure of hernia, wiring the patella, excision of varicose veins, gasterenterostomy, resection of intestine, resection of ribs for empyema, etc. Practitioners of dentistry have utilized the cataphoric action of the galvanic current as a means of introducing cocain into the deeper tissues and especially for allaying the sensitiveness of dentine, or of inflamed pulp. In such cases, a small quantity of a strong solution (20

to 40 per cent), is introduced upon absorbent cotton, wrapped on the end of a probe connected with an electrode, the other or indifferent electrode being held by the patient in contact with another part of his body.

A weak galvanic current is allowed to pass for a few minutes, or until the tooth is completely analgesic, thus permitting the cleaning out of the pulp canal without devitalizing the nerve and without pain. The dentists have also demonstrated the anesthetic effects of orthoform, when placed in contact with inflamed mucous membrane. Toothache caused by irritation to an exposed pulp can be relieved almost instantly by washing out the cavity well and applying powdered orthoform. According to Dr. C. H. Blackburn* this treatment will relieve the pain entirely for from one to three days and longer, at times. Dr. Blackburn has also used nirvanin in 3 to 5 per cent solutions as a substitute for cocain. He considers it much safer, especially for a local anesthetic, for the extraction of teeth, by injection into the gum. It does not cause faintness or dizziness and can be used in cases where cocain would be dangerous. Black-

* Items of Interest, September, 1900.

burn states that "five per cent solutions of nirvanin have frequently been used with good results, where, at previous times, 2 per cent and less of cocain solutions have caused symptoms of sickness and poisoning," and says it "surely is a local anesthetic of inestimable value to the dental surgeon."

As cocain solutions lose their strength by sterilization and are liable to be attacked by penicillium and other microphytic growths, there is a distinct advantage in substituting eucain B, or nirvanin, which are free from these objections. Dr. Sidler, assistant to Prof. Haab, in Zurich, has suggested as a menstruum for cocain, a fresh sublimate solution of 1 to 10,000, or a 1 per cent carbolic acid solution. He also recommends alcohol as being admirably adapted for making mother solutions, which will keep aseptic for years. He considers a solution of 3 to 20 G, or 5 grains of cocain to two-thirds of an ounce of a 40 per cent solution of pure alcohol, as the best; it should be kept in a glass-stoppered bottle, which has been previously sterilized.

REGIONAL ANESTHESIA FROM INJECTIONS OF COCAIN INTO THE SPINAL SUBARACHNOID SPACE: SPINAL COCAINIZATION.

The credit of priority of performance and of publication of this method of producing analgesia of the lower extremities and part of the trunk of the human body, by injecting cocain into the subarachnoid space of the spinal cord, belongs to Dr. J. Leonard Corning of New York, who brought it to the notice of the profession in 1886 and again in 1894. It was brought more prominently before the profession by Dr. A. Bier, of Hamburg, in 1899, and more recently by Tuffier and numerous other writers. The lumbar region is usually selected for the subarachnoid injection. Recently Tait and Caglieri of San Francisco have expressed a preference for the sixth cervical space, as the avenue for the introduction of the analgesic agent. Rudolph Matas does not regard this as a safe route, however, because of the greater liability of producing toxic phenomena, on account of the close proximity of the medulla oblongata, which is known to be extremely susceptible to the paralyzing influence even of very small quantities of cocain. For experimental purposes, the skull has been trephined,

and, also, the atlooccipital route followed in making injections, but the lumbar puncture is universally regarded as the safest. The technique is as follows:

When the patient is in a sitting posture and the body bent forwards, the patient's hands resting upon his thighs, a horizontal line, drawn across from one iliac crest to the other, will indicate the interspace on either side of the spinous process, between the fourth and fifth lumbar vertebra. When this landmark has been clearly identified, it is an easy matter to introduce the cannula into the canal by inserting it at a point just below and 1 cm. to the side (usually the right) of the spinal process. The skin should be previously sterilized and rendered insensitive by Schleich's local anesthetic method and by deep injection with a long, hypodermic needle. The specific directions are thus given by Dr. Matas:

"The cannula of the injecting syringe with a small (30 minim) empty, hypodermic syringe attached, is held in the right hand, and is made to penetrate the skin about 1 cm. ($\frac{1}{4}$ in.) to the right and immediately below the fourth lumbar spine. The cannula is thrust slowly and steadily forward towards the median line, into the

interspinous space for a distance usually of 2½ to 3 inches (about 6.50 to 7 cm.). If the needle has penetrated the subarachnoid space, a diminished resistance is felt, which is unmistakable to the experienced operator, and if the piston of the syringe is drawn, a perfectly clear, watery fluid—the cerebro-spinal fluid — will immediately flow into the chamber and the evidence will be conclusive that the subarachnoid space has been tapped. The moment the presence of the fluid is established—and a few drops of the fluid are sufficient—the exploring syringe is disconnected and another syringe, already charged with the anesthetic solution, is attached and the anesthetic is slowly injected. Care must be exercised to avoid any unnecessary loss of cerebrospinal fluid, as serious accidents have followed excessive drainage in several cases. Bier, himself, was made quite ill from this cause when the method was tried on himself by his assistant, Hildebrand. This accident is easily avoided by using syringes that are fitted without screw tips."

It is understood that the *operation should be aseptic in all its details, the solution and the needle, as well as the skin of the patient.* Care must also be observed with regard to the dose.

Tuffier, who has used this method in over 130 cases, uses a 2 per cent solution of cocain hydrochlorid, of which he injects 1 c. cm. (15 minims). Matas approves this and advises, in case no effect is produced in 8 or ten minutes, to repeat the injection, using the same quantity, which has usually been followed by satisfactory results. The needle is at once withdrawn after the injection and the little wound sealed with collodion. In his later operations, Matas has employed Schleich's combination with such good results as to lead him to continue its use in future. The method of preparing the solution is given as follows: Five tablets, each containing 1-5 grain of cocain hydrochlorid; 1-40 grain of morphin hydrochlorid, and 1-5 grain of sodium chlorid are dropped into 100 minims of hot, distilled water and dissolved. The solution is then to be sterilized by the fractional method. Twenty minims of this solution, therefore, will represent 1-5 grain cocain, 1-40 morphin and 1-5 grain sodium chlorid. The syringe of 30 minims capacity, is then filled with the solution, and 22 minims are injected, the excess of two minims being allowed for waste. The solution should always be used warm (about 90° to 100° F.). The tablets are

those made by reliable manufacturers for ready preparation of Schleich's Solution No. 1. The object of the addition of the small quantity of morphin was to intensify and prolong the anesthetic effect of the cocain without adding to its toxic qualities, and also for its sedative action upon the cerebral cortex, allaying anxiety and excitement. It is important that all needles used for spinal cocainization should be cut sharp *but short at the point,* as a long, very oblique bevel point may penetrate the canal and yet allow the contents to escape in the extradural space (Matas). As regards the direction of the needle, the point should be directed towards the median line in the center of the interspinous space, keeping closer to the upper spine than the lower. Further attempts at penetration should be discontinued as soon as the characteristic sensation of diminished resistance is felt. This, however, cannot be adopted as proof conclusive that the canal has been entered, but Tuffier's golden rule should be obeyed: "Never to inject the cocain solution until the cerebrospinal fluid is distinctly recognized."

The operation of lumbar puncture is not without danger. Gumprecht, up to June, 1900,

had succeeded in collecting seventeen cases in which death had followed quickly after lumbar puncture for exploratory purposes. Heamberg has reported a case of intradural and medullary hemorrhage following an injury to the veins which accompany the filum terminato, but this was in a case in which there was tuberculous disease of the meninges. Matas states that in ordinary normal conditions, injury to the cauda equina and filum are almost impossible, the caudal nerve fibres being so mobile in the fluid that they are easily pushed aside by the needle; hence, the advantage of using a needle that is not too pointed. Tuffier has had five deaths out of 125 cases of spinal cocainization by lumbar puncture, four of which could not be attributed to the anesthetic, the fifth, however, died with symptoms of asphyxia. Among the post-operative toxic symptoms is severe headache, which is readily relieved by phenacetin and caffein. In some cases there appears pallor, sweating, vomiting, requiring the use of stimulants and heat; in one case, numbness and tingling of the feet persisted for twelve days after the operation.

Matas, from his personal experience, would

limit the indications for the application of spinal cocainization:

1. To adults and to reasonable persons, who have good self-control, thereby excluding children, hysterical persons and the insane.

2. To patients in whom methods of local or regional anesthesia are inapplicable.

3. To patients suffering from emphysema, advanced asthma, chronic bronchitis and other respiratory affections, in whom a general inhalation anesthetic is absolutely contraindicated; in advanced cardiac cases with degenerative lesions, he would fear the possible depressing effects of the injection and excitement on the circulation.

4. In the majority of cases in which the painful part of the operation is not likely to be prolonged beyond one hour and a half. He would be averse in the present state of our knowledge to repeat the cocainization or to increase the total dose of the cocain to more than 2 c. gm. (1-3 grain), especially in exhausted subjects.

Experience upon the lower animals made by Nicolette, of Naples, have shown that other substances than cocain, notably ergotin, antipyrin, and quinin have produced analgesia. In

a case reported by Dr. Geo. R. Fowler, of New York, antipyrin was employed (30 minims of a 2 per cent solution), and analgesia was apparently produced up to the nipples. This was followed four hours later by severe headache and persistent nausea and vomiting. The temperature rose to 101° twelve hours after the injection. (Phil. Med. Journal, Nov. 3, 1900.) The occurrence of these symptoms resembling those produced in the cases of spinal cocainization, suggests that they are probably caused by alteration of tension of cerebrospinal fluid, or to irritation due to the presence of foreign substance, rather than to the physiological or toxic action of the cocain.

Dr. A. M. Phelps, of New York, warns the profession of the dangers of this method and reports a death in his own practice after the injection of 30 minims of a 2 per cent solution of cocain, the patient dying within two hours after the operation. He has witnessed, within twelve months, two other deaths from the same cause. He considers that in safety it cannot compare favorably with the general anesthetics, ether, nitrous oxid gas, or chloroform. He points out the fact that, in some patients, there exists an idiosyncrasy against

cocain, so that what would be regarded as a perfectly safe dose under ordinary circumstances, in these exceptional cases would cause death.

Dr. S. Ormond Goldan (Phil. Med. Journal, Nov. 3, 1900, p. 868), advances the same opinion, and says that intraspinal cocainization is at the end of the list of anesthetics, when speaking of its general practicability. It is useful, however, in exceptional cases, where the ordinary anesthetic agents cannot be used (Medical News, Nov. 10, 1900).

Cadol (Gaz. Hebdom de Med. et de Chir., June, 1900), holds a more favorable view and regards spinal cocainization as holding a useful place between general anesthesia and the local anesthesia of cocain. According to this writer, it is likely to hold a wide field of application, not only in hospital and civil practice, but in obstetrics and military surgery.

ANIMAL REMEDIAL PREPARATIONS.

Various glands, from freshly slaughtered sheep and other animals, employed either in

the fresh state, or else dessicated, or as carefully prepared extracts, have within the past few years found a constantly increasing usefulness in therapeutics.

Brown-Sequard's enthusiastic claim, that "all the glands of the body, whether excretory or not, supply to the body useful principles, the absence of which is felt, when these glands are extirpated or destroyed by disease," spread like wild-fire around the world, and gave the charlatans a remunerative field for humbuggery and flowery advertisements.

As a natural consequence, conservative and careful observers at first were rather skeptical in the acceptance of such sweeping statements, especially so as failure was the rule when these remedies were employed.

The attention of the profession was, however, called to the subject, and not only Brown-Sequard and his associate, d'Arsonval, but the best scientific minds in the profession in every land gave painstaking and untiring labor to a careful and systematic experimentation, which resulted in giving the materia medica some of its most positive remedial agents.

The striking effect of the employment of

the thyroid gland, or a carefully prepared extract thereof, in myxedema, is indeed an ideal illustration of Brown-Sequard's theory.

We know that myxedema is caused by absence or disease of the thyroid gland and, therefore, the result of the withdrawal of the secretion of the gland. In cretinism or congenital absence of the thyroid, or after operative removal of the gland, a similar condition exists. No form of treatment gave any material benefit to these conditions up to the time that the extract of the thyroid was first used. Astonishing results follow its employment. All the signs and symptoms of the disease disappear; under the continued use the individual may absolutely recover his health and remain well so long as the administration of the thyroid extract is continued. As soon as it is discontinued, the previously existing symptoms gradually reappear, however, proving beyond a doubt that it is the absence of the specific principle of the thyroid gland that is the cause of the disease. Unfortunately like striking results have not followed the employment of all the other glandular extracts. The success of the thyroid treatment has, however, led to a more thorough study of

biology and the allied sciences, and we have as a consequence not only the glandular extracts, but also extracts of bone-marrow, the nucleins, etc., all of which undoubtedly have their usefulness, though as yet not sufficiently defined and studied.

The main difficulty with the definite and scientific study of the active principles of these various animal secretions and organs, is their minute quantity, which limits the study of their chemical nature. Their great activity—as evidenced not only by their individual specific effect, but also by other manifestations such as tachycardia, faintness, etc., following the administration of even small doses—seem, however, to be caused by an organic principle belonging to the class of leucomains, lecithins and protagons, etc., and when we recall that, for example, the licithins under certain experimental conditions even split up into glycero-phosphate, stearic acid and cholins, the powerful actions of which are well known, we readily see that we have certainly arrived at the borderland of the more definite science of the future.

The antitoxic effect of cholin, caused by its oxydizing action on the blood, is probably

one of the very few facts beyond dispute, however, it may be wisest not to attempt to discuss any especial line of theorizing regarding the chemical nature of this complex and as yet vague subject. A short resume of the chemical and experimental facts and deductions up to the present date may, however, not be amiss, after first giving a short resume of their pharmacology.

All of these animal remedial agencies are to be had either in the form of the dessicated powder, or as liquid extracts. On account of the very rapid chemical postmortem changes especially in glandular structures and secretions, the greatest care, rapidity and aseptic precautions have to be observed, to insure that we find what we are looking for, and it may on that account be most desirable to employ the sterile glycerine extract, as prepared by some reliable and scientific firm, though in many instances the dessicated powder or compressed tablets, prepared after the admixture of lactose may fulfill our purpose.

Thyroid gland and preparations thereof have received the greatest amount of study and renown (Dr. Murray, Galvestonian lectures, 1899). Besides its use in myxedema,

cretinism and exophthalmic goitre, it has of late been extensively used in obesity (in which, however, the heart needs careful watching), with at least temporary good results, and several cases of cure or improvement have been reported of diabetes mellitus, eczema, psoriasis, uterine fibroma, metrorrhagia and even in hemaplegia. It is claimed also to render more active the process of bone formation and is therefore useful in fractures.

Thymus gland or its extract has apparently given somewhat similar results to the thyroid with the exception that it does not stimulate the heart or cause increased metabolism as does the thyroid, and, causes therefore no loss in weight.

Suprarenal therapy has within the last year gained the most enthusiastic followers, and as its literature for the present is rather scattered, a somewhat more lengthy review may be in order. The suprarenal extract increases the tone of all muscular tissue. On this account and also by its astringent effect upon the blood vessels it is the strongest known stimulant to the heart and an ideal heart-tonic (Bates, Med. News). On this account it is also employed in Addison's disease,

diabetes insipidus and all other diseases arising from or accompanied by vasomotor disturbances. Its aqueous solution has of late gained a well-earned reputation as a powerful astringent, whether applied locally or taken internally. It is the best hemostatic known, as it acts by contracting the small arteries and has no chemical or other effect on the blood; is non-irritating and does not form clot. Given by mouth in 0.3 gm. (5 gr.) doses the suprarenal extract will quickly ameliorate congestion of any part of the body as the eye, ear, nose, throat, lungs, liver, kidney, bowels, etc. (N. Y. Med. News, March, 1900). Hemorrhage from the nose or gums can be stopped even in hemophilia by the liberal application of the aqueous extract or emulsion, and Otis has controlled hemorrhage from the bladder by the same means.

On account of its hemostatic and astringent action the suprarenal extract is invaluable in eye, nose, throat and ear work.

Nose and Throat: When applied locally as an aqueous extract, it whitens the inflamed mucous membrane of the nose in one minute and is an adjuvant to cocain to secure anesthesia. Given internally in 0.3 gm. (5 gr.)

pions also claim excellent results; in many conditions from such causes as diabetes mellitus, uric acid diathesis, rachitis, neuroses, tabes, syphilis, pneumonia, typhoid fever. In carbon dioxid poisoning or chloroform anesthesia, where the oxydizing power of the blood is reduced, spermine is claimed to restore the blood to its normal state. The elaborate and very fetching theories in this line are, however, though very interesting, too lengthy for this review.

Prostate gland extracts have been employed in hypertrophic changes of the prostate.

Ovarian extract has been used to ameliorate the distressing nervous and vasomotor disturbances coincident with the menopause and after extirpation of the ovaries. Beneficial effect has also been claimed for its employment in chlorosis. In the male it acts as an aphrodisiac (Ferre).

Brain extracts have their ardent advocates, who offer most attractive theories. Althaus suggests, for example, that their action is due, first to the injection of a highly specialized pabulum of nervous matter; second, to the decomposition of its lecithin prota-

gon through the alkaline blood whereby not only glycero-phosphoric acid, but also cholin, are formed. He claims that cholin by its oxydizing action on the blood acts as an antitoxin.

Bone-marrow extracts have lately, and seemingly with good cause, become very popular in the treatment of both primary and secondary anemias. Various firms have prepared either extracts of the red marrow per se, or combinations of this extract with nucleo-albumins of iron, which certainly are both rational and clinically successful. The near future will without doubt give further light on this subject.

ANTIPYRIN.

(Phenazon.)

$C_{11}H_{12}N_2O$.

Antipyrin, the di-methyl phenyl-pyrazolon, a synthetic base from which numerous salts are formed is so familiar to the physician that an extended description of its chemistry or physical properties would be superfluous. In brief, antipyrin occurs in colorless and odor-

less crystals, which are freely soluble in water, and which melt at 112-113 deg. C.

A solution of antipyrin is turned green by addition of spts. etheris nitrosi or dilute sulphuric acid, and red by addition of ferric chlorid. It is incompatible with carbolic, tannic and dilute hydrocyanic acids, chloral hydrate, decoction or extract of cinchona, iron sulphate, ferric salts, Donovan's solution, calomel, betanaphtol, the nitrites, bicarbonate and salicylate of sodium tinct. iodin, and all infusions or tinctures containing tannin.

Antipyrin is unquestionably the most important of the list of antipyretics, analgesics, local anesthetics and hemostatics yet offered by the synthetic chemist. It reduces temperature with marked increase of comfort to the patient; decreases the rate but not the force of the pulse; is the most useful analgesic, indeed there is scarcely a condition accompanied with pain which antipyrin will not relieve, being especially marked in migrain, locomotor ataxia, rheumatism and neuritis of whatsoever character. It is also useful in the first stages of labor, and in its quieting of nervous irritation. Its action in urticaria, nocturnal emissions and in hysteria is found to be uniformly suc-

cessful. In excitability of the motor nerve centers, such as chorea, whooping cough, tetanus, epilepsy, etc., its use has afforded the happiest results. Prof. H. C. Wood says that "when combined with ammonium bromid its use is much more efficacious in epilepsy than are the bromids alone." Again its power to control the secretions in diarrhea, diabetes mellitus and insipidus, and in the arrest of the secretions of milk can always be relied upon. Clement claims it to have a remarkable power in bringing about the absorption of pleuritic effusions. As a local anesthetic when applied to the mucous membrane in solution of 10-50 per cent it is even more efficacious than cocain, numerous operations in minor surgery having been painlessly performed. Finally, as a hemostatic, antipyrin is certainly the most desirable, controlling hemorrhage without a corrosive action, in solutions of from 5 to 15 per cent. Its use hypodermically has been recommended, and as it forms a neutral solution no ill effects arises from its use in this manner. The dose of antipyrin is from 0.3-1.3 gm. (5-20 gr.) per day, which may be continued for long periods.

APOLYSIN.

(Mono-phenetidin-citric acid.)

$$C_6H_4\begin{cases}OC_2H_5 \\ NH.CO.C_3H_4(OH)(COOH)_2.\end{cases}$$

Apolysin resembles phenacetin in its chemical composition, but contains citric acid instead of acetic acid as the acid radicle. It is a yellowish crystalline powder, soluble in 50 parts of cold and 25 parts of boiling water. It is also soluble in glycerin and in nitric and sulphuric acids. Seifert claims that apolysin is free from poisonous effects and useful as an antipyretic and analgesic. The dose is from 0.5-1.3 gm. 7½-20 gr.)

APOMORPHIN.

$C_{17}H_{17}NO_2$.

Apomorphin as an hypnotic has been recommended by Dr. Chas. J. Douglas in the N. Y. Medical Journal (Oct. 28th, 1899; March 17, 1900). He says: "Apomorphin as a hypnotic acts with the precision of clock-work. If the dose is properly adjusted the patient will fall into a sound and restful sleep in from

five to twenty-five minutes, without nausea or other disagreeable sensations. If no results are obtained within half an hour after its administration, the dose was too small. It acts within that time if it acts at all. Vomiting indicates too large a dose. I have had two or three cases that required unusually large doses to produce sleep, and I further discovered that emesis could not be produced in these patients with any quantity, however large. Hypnotic doses slightly accelerated the heart's action in every case in which I have observed any change at all in the pulse. The direct hypnotic action of apomorphin lasts apparently from one to two hours. But in many cases of insomnia the patient will sleep all night if he is only started right, and put promptly to sleep on going to bed. . . . . It not only produces sleep more promptly and surely than any other safe remedy, but its sleep has all the appearance of a perfectly natural one. . . . Apomorphin has no cumulative effects, and consequently may be repeated at short intervals, if necessary. . . . There is no possibility of a 'drug habit' being formed, as it becomes a vigorous emetic if the dose is increased to only a tenth of a grain. Both as

a hypnotic and an emetic it is thoroughly neutralized if dissolved in a saturated solution of boric acid. . . . 0.0022 gm. ($^1/_{30}$ gr.), injected subcutaneously, is the average hypnotic dose . . . and a still smaller dose, in many cases, acts as an efficient hypnotic. . . . Under ordinary circumstances this remedy should be administered when the patient is in bed, or quite ready for bed. . . . In active delirium, when the patient objects to going to bed, no attention need be paid to this rule, as he will voluntarily lie down in a few minutes after the remedy has been injected. . . . Morphin patients, when suffering from the persistent insomnia that follows the withdrawal of that drug, are put to sleep with the same promptness and precision by the use of apomorphin. In fact, it is, in my experience, practically the only hypnotic that can always be relied on in such cases." . . . Zenner, N. Y. Med. Jour., Mar., 1900, details a case of tachycardia in which for a time apomorphia controlled the heart's action in doses of 1/10 grain hypodermically, but after a time the remedy failed to afford relief. He gave sufficient to produce

emesis, after which heart's action was quieted to a normal degree.

ARGENTAMIN.

(Ethylene-diamin-silver-phosphate.)

Argentamin is a clear, colorless liquid with an alkaline reaction, sp. gr. 0.97. It is a solution of silver phosphate in an aqueous solution of ethylenediamin and thus an organic form of silver. A 10 per cent solution contains as much silver as a 10 per cent solution of silver nitrate. Like all silver salts, argentamin should be protected from the light. It does not precipitate albumen and thus penetrates deep into the tissues.

Used as an antiseptic in ophthalmology, in 5 per cent solution, it produces less pain and irritation than silver nitrate and penetrates deeper (Hood). It is useful in the specific urethritis of the posterior urethra, in a solution of 1 to 250. In the anterior urethra it should not be used stronger than 1 to 2,000 (Aschner, Neisser and Schaeffer).

ARGONIN.

(Argentum Casein.)

Argonin is the product of the chemical action of silver upon sodium casein, and is produced by adding a solution of the sodium casein to a solution of silver nitrate and precipitating by addition of alcohol. A white powder results, which should be free from either an acid or alkaline reaction. It is not perceptibly soluble in cold water but is freely so in hot water; is not precipitated by a solution of sodium chlorid or by albuminous fluids. Fifteen grains contains as much silver as does one grain of silver nitrate.

It does not coagulate albumin; is strongly antiseptic and has been largely used in urithritis (gonorrheal). It does not irritate the mucous membrane, but its bactericidal action is pronounced; the astringent action is only slight. For this reason it is sometimes necessary to alternate the use of argonin with an astringent, especially so in the chronic stages of gonorrhea.

The strength of the argonin solutions varies with the cases treated; usually from 2½ to 10 per cent solutions are used. 10 c.cm. (160 min.) of such a solution may be injected

into the urethra and allowed to remain for five minutes. When so used the gonococci permanently disappears in from one to four weeks.

Solutions of argonin should be made fresh when needed, or, if kept for any length of time, protected from light by placing in dark-colored glass.

We have in argonin a remedy fatal to the specific germs of gonorrhea, none of the gonococci being found after the fifth day by repeatedly examining the discharge for them with the microscope. (Dowd). In the treatment of twenty-five cases of gonorrhea McGovern (Milwaukee Medical Journal, 1898) "used argonin injections once or twice a day, and retained the solution in the urethra for several minutes. In every case where argonin solution (generally 10 per cent) was employed, within a few days after the discharge began, the results were very satisfactory. The discharge became very slight after the third or fourth injection; redness and swelling of the meatus disappeared, and there was general subsidence of the symptoms." "Argonin may be employed in gonorrhea in every stage as a gonococcicid without danger, even in

concentrated solutions, there being no irritation" (Jadassohn). In the treatment of fifteen typical cases of gonorrhea with argonin, Gottheil found that the gonococci disappeared on an average in eight days, but this was followed by injection of astringent solutions for twelve days longer, in order to complete the cure. He found that argonin was non-irritating and well tolerated. Individual exceptions were met with, but no importance was attached to them, since they probably arose from abnormal irritability. In 70 cases treated there was but one complicated by epididymitis.

Branch Clark reported (Therapeutic Progress) fifteen cases of gonorrhea treated with argonin, and concludes by saying that not only do injections of argonin (5 per cent) bring about a quick cessation of the discharge, but promptly relieve the urethral irritation thus conducing much to the comfort of the patient.

Other references, such as Swinburne, Floeckinger, Bigelow, Daniel, Storer, Jacobson, etc., have been noted, all being favorable to the remedy in urethritis.

E. C. Ellett (Memphis Med. Monthly), re-

ports the successful use of argonin, 5 per cent solution, in the treatment of gonorrheal ophthalmia, one with perforated corneal ulcer complicating. He states that the solution is non-irritating, and can be dropped into the eye without the necessity of everting the lids as in the application of silver nitrate.

ARISTOL.

(Dithymol-diiodid.)

$C_{20}H_{24}I_2O_2$.

Aristol was originally known as annidalin. It differs, however, as at present made in being, as above stated, the dithymol-diiodid, while annidalin is the dithymol-triiodid. It is prepared by decomposing a solution of iodin in potassium iodid by an alcoholic solution of thymol.

If a solution of iodin in potassium iodid (iodin, 6 parts, potassium iodid 9 parts, water 10 parts) be allowed to flow into an alkaline solution of thymol (thymol 5 parts, sodium hydrate 1.2 parts water 10 parts), at a temperature of 15 to 20 deg. C., with constant stirring, a dark reddish voluminous powder will

precipitate and this is aristol. It must then be filtered off, washed with water and dried at an ordinary temperature, great care being taken not to raise the temperature as this will decompose the aristol. The product is said to be made also by mixing the alkaline solution of thymol and iodin, and then subjecting the whole to electrolysis when iodin is liberated and combines with the thymol.

Aristol is a brownish-red amorphous powder, with an aromatic odor, insoluble in water and glycerin, slightly soluble in alcohol, freely so in ether and collodion. It is also soluble in the fatty oils when stirring or friction is applied and in lanolin as well as vaselin. It is easily decomposed by light and heat and should, therefore, be kept in a cool and dark place.

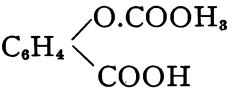
Aristol contains 45.8 per cent of iodin and is offered as a substitute for iodoform, being nearly odorless; but authorities do not accord it the distinction of being equal to iodoform in antiseptic surgery. Aristol is not germicidal according to Neisser when used as a powder, but in an ethereal solution it has germicidal properties. Application of aristol in nose and throat surgery, in suppositories in

chronic dysentery and in superficial ulcerations, eczema, psoriasis and various other skin affections have been reported on favorably. Eichoff was successful with it in the treatment of lupus, indolent ulcers, in ulcerative processes of syphilis and in burns.

Aristol may be used in solution with ether, oil and collodion 5 to 10 per cent, or as an ointment with lanolin, 5 to 10 per cent.

ASPIRIN.

(Acetyl Salicylic Acid.)



Aspirin, or acetyl salicylic acid, is the newest addition to the already long list of salicylic acid derivatives. Being a chemical combination of acetyl with salicylic acid it is not decomposed to any extent in the stomach, and is thus devoid of irritating effects upon this organ. Its decomposition is effected in the alkaline fluids of the intestinal canal, where its salicylic constituent is gradually liberated and absorbed.

The reports that have thus far been published show the comparative tastelessness of the preparation and its freedom from the unpleasant constitutional effects of salicylic acid, this being attributable to the slower and more gradual absorption of the drug. Owing to its insolubility aspirin is best administered mixed with sugar and water, or in wafers.

Its indications correspond with those of salicylic acid and the salicylates. The first report on this drug is from the Medical Clinic of Prof. Leyden, Berlin, by Wohlgemuth (Therapeutische Monatshefte, No. 5, 1899). Experiments on animals showed that its decomposition takes place almost completely in the intestinal canal. It was also tested upon cases of acute articular rheumatism and in rheumatoid pains occurring in connection with scarlatina, diphtheria, angina, and other diseases.

The general conclusion reached by the author is that aspirin is an improved substitute for salicylate of sodium, devoid of its unpleasant sequela. R. Witthauer (Die Heilkunde, April, 1899) employed the drug in 50 cases, comprising articular and muscular rheumatism, pleuritis and gout, and found

that it was well tolerated in cases in which the salicylate of sodium excited aversion and disagreeable after-effects. F. C. Floeckinger (Medical News, Nov. 18, 1899) states that aspirin has the same therapeutic action as salicylate of sodium, with the advantage that it is more agreeable and does not disturb the stomach. Distressing tinnitus occurs only rarely from the administration of physiological doses. He calls attention to the absence of cardiac depression, and to the fact that the drug does not impair the appetite, even during prolonged use.

The cases reported comprise chiefly dry pleuritis and acute articular rheumatism. G. C. H. Meier (American Therapist, December, 1899) describes in detail 12 cases treated with aspirin, with results confirmatory to the above. In some instances convalescence was somewhat shorter than with the salicylate treatment, which he attributes to the fact that the patients preserved their appetite, and therefore were able to take a larger amount of nourishment. Other observations have been published relating to the use of the drug, particularly in rheumatism: Lengyel (Journal of Medicine and Science, October, 1899); A. F.

Schellschmidt (New Albany Medical Herald, February, 1900); Friedeberg (Centralblatt fur Innere Medicin, No. 15, 1900).

Aside from its use in rheumatic affections aspirin has proved serviceable in the treatment of neuralgias, to which attention has been called by R. Weil (Allgem. Med. Central-Zeitung, No. 4, 1900), who utilized its analgesic qualities in several cases of cancer of the internal viscera, and also in a case of tabes. L. Goldberg (Deutsche Medizinal-Zeitung, No. 20, 1900) also speaks favorably of its use in neuralgic affections, especially migrain.

BENZOSOL.

(Guaiacol Benzoate.)

$$C_6H_4\begin{cases} O.CH_3 \\ O\text{-}C_6H_5CO. \end{cases}$$

Benzosol is a compound of guaiacol in which a hydrogen atom of its hydroxyl is replaced by benzoyl, and is obtained by first the formation of a potassium salt from crude guaiacol, and the purifying of the salt by recrystallization from alcohol. The product

is then warmed with a calculated amount of benzoyl-chlorid, benzosol resulting, after which it is recrystallized from alcohol.

It is a colorless crystalline powder with but a slight and not unpleasant odor and taste. Melts at 59° C., is insoluble in water, readily soluble in hot alcohol, ether and chloroform. It is said to contain 54 per cent of guaiacol.

The therapeutic value of benzosol depends upon the combined action of guaiacol and benzoic acid, the decomposition taking place partly in the stomach, but chiefly in the small intestine, as the result of the action of the alkaline secretions, being excreted in various combinations in the urine.

Butler, in "The American Therapist," used benzosol in the treatment of pulmonary tuberculosis, in one case giving it steadily for over a year, 0.3 gm. (5 gr.) ter in die, resulting in rapid improvement. There was a distressing cough with abundant expectoration of muco-purulent sputum rich in tubercle bacilli, great emaciation, evening temperature and night sweats. The patient gained in flesh and strength, fever and night sweats ceased, cough lessened and expectoration became scant. In the beginning of treatment the patient was confined to bed,

but in six months she was up and about, able to attend to light household duties. In some instances benzosol was given in conjunction with cod liver oil and hypophosphites, but careful observation demonstrated that tubercular patients improved more rapidly when benzosol was given alone. In all the cases there was improved appetite, diminution of bronchial irritation and secretion, hectic abated, diarrhea was controlled and life was prolonged.

In typhoid fever benzosol was found beneficial, as well as in the intestinal catarrh (summer complaint) of infants.

J. Blake White, "American Medico-Surgical Bulletin," reports good results with benzosol in the treatment of diabetes mellitus, the severe cases being transformed into mild ones, while in some cases sugar entirely disappeared from the urine; the quantity of urine was lessened and the specific gravity lowered. Aspinwall, Putney, Reynolds, Eberhart, McCullough, etc., report in American journals similar experiences with benzosol in diabetes mellitus. Stucky reports cases of dilatation of the stomach resulting largely from fermentation greatly benefited by the

action of benzosol as an antiferment, and through its stimulating effect upon intestinal and gastric digestion.

Salinger, Hoelscher, Thomitz, Snow, North, etc., report marked results with benzosol in phthisis, while equally favorable results have appeared from time to time concerning its action in cystitis, and all forms of intestinal disturbances dependent upon fermentation and putrefaction.

BROMOFORM.

(Tribrommethan.)

$CHBr_3$.

Bromoform is produced by the action of bromin on aceton, etc., in the presence of an alkali. A colorless, heavy liquid of chloroform-like odor, sp. gr. 2.83; soluble in alcohol, but only slightly in water.

Primarily recommended for whooping cough, 1 drop for infants, up to 6 drops for large children, three times daily. It is recommended for ozena by Solis-Cohen.

There is considerable danger in dispensing bromoform, as the heavy liquid—unless prop-

erly suspended in oils, syrups, etc., and thoroughly shaken before each dose—is liable to settle, and the final doses from the bottom of a vial may prove too large and be poisonous. Numerous good combinations have been recommended; but care is always advisable in administering it.

Bromoform has been reported on with approval in whooping cough by Carpenter, Burton, Fanning, Marfan, Ritter, Ferreira, Eross and many others. Hallopeter (Therap. Gazette, October, 1894), on the other hand, was disappointed in it. Solis-Cohen recommends bromoform as a local analgesic for painful tubercular ulcerations (N. Y. Med. Journal, Oct. 24, 1896).

CALCIUM EOSOLATE.

$(C_9H_7S_3O_{12})2Ca_3$.

Calcium Eosolate contains about 25 per cent of creosote. It is a fine grayish powder, of pungent odor and acrid taste. Soluble in 8-10 parts of cold water and in 7 parts of hot water; slightly soluble in alcohol; insoluble in chloroform and turpentine; readily soluble

in hydrochloric and nitric acids; slowly soluble in acetic acid.

Under title of "A Sulphosalt of the Aliphatic Creosote-esters and Its Therapeutic Usefulness," Heinrich Stern reported to the American Medical Association last year his experiences with calcium eosolate, which he had been studying since 1898. His report (Jour. A. M. A., Feb. 24. 1900) includes the records of cases of diabetes insipidus, diabetes mellitus and chronic ulcerative phthisis which has shown decided improvement under treatment by calcium eosolate. The dose is 0.3-0.7 gm. (5-10 gr.) though this may be much increased. The salt can be administered for long periods and is usually well borne, but intestinal derangements require modifications of its mode of administration. Stern believes that the medicinal action of calcium eosolate depends on its neutralizing qualities, which others may be tempted to call "antiseptic" or "germicidal." * * * "It does not destroy germs or micro-organisms, but it apparently effects a condition of the system, especially of the fluids, which is averse to bacterial growth * * * (and) is a positive and

harmless neutralizer of a number of toxic substances of non-bacterial origin."

CAMPHORIC ACID.

$C_8H_{14}(COOH)_2$.

Camphoric acid is a chemical product resulting from the action of nitric acid upon camphor; it occurs in handsome white, scaly crystals, is sparingly soluble in (200 parts) cold water, but readily in (10 parts) hot water, in alcohol, ether and in fatty oils.

It was first introduced therapeutically by Reichert in 1888, applied in one-half to 6 per cent solutions in coryza, bronchitis, etc. Later it proved serviceable in cystitis in one-half to 2 per cent solutions by injection. Schultzer, Combemale, Len, Deesman, and others, reported on its value in aborting night sweats in phthisis (in 1899), confirmed in 1891 by Stockman, Hare, etc. Since then the drug has come into gradual use and is everywhere quoted as an efficient agent in combating night sweat, but the record warrants greater popularity than it enjoys.

The dose is 1.0-1.5 gm. (15-24 gr.), to be

taken about two hours before the probable appearance of the symptom which it is to abort.

CARBOLIC ACID.

(Phenol.)

(C_6H_5OH.)

This agent, because of the popular uses to which it is put as a disinfectant, and because of the ease with which it is purchased, is resorted to rather frequently by those desiring to commit suicide. It is no uncommon event, and for this reason the profession must needs keep abreast of later information concerning antidotes.

Buchanan, in the New York Medical Record, recentely reported a case of attempted suicide, the patient swallowing an ounce of a 95 per cent carbolic acid. Alcohol was used in 35 per cent solution to wash out the stomach, two quarts being used, and recovery taking place, notwithstanding the mucous membrane of the mouth was apparently destroyed.

Harnsberger in Charlotte Med. Jour. reports an accidental poisoning in a boy of 16 from 1½ oz. carbolic acid, who recovered after the ad-

ministration of a pint of cream followed at short intervals for several hours with cream and unskimmed milk.

Flynn reports two cases of accidental poisoning with carbolic acid, both of which recovered after treatment with large quantities of milk. After the stomach has been emptied, which should be done as soon as possible, magnesium or sodium sulphate should be given, which unites with the carbolic acid to form the harmless sulphocarbolates. Strychnin should be given hypodermically to sustain the heart, and heat applied to the surface of the body together with friction.

Seneca D. Powell, in a paper presented to the New York Academy of Medicine, declares that it is possible for one to use a 95 per cent carbolic acid freely, and no destruction of tissue result, providing it be freely washed away with alcohol.

Seven cases of erysipelas were promptly checked by using pure carbolic acid, and after a few moments the application of alcohol.

Some unfavorable reports have appeared concerning the use of carbolic acid, gangrene resulting in some instances from rather weak solutions.

Carbolic acid has recently been used in the treatment of tetanus, as advised by Bacelli, and the reports published. One observer declares that better results have followed the hypodermic use of this agent than from the use of tetanus antitoxin. Its use is followed, according to some authorities, by diminished muscular contractions or spasms, and in some instances recovery. It should be used in large doses, according to Wood of Philadelphia, who declares it more reliable than serum.

The dose given is, first 0.7 c.cm. (10 min.) of a 10 per cent solution, then increased to 1.3 c.cm. (20 min.) in fifteen minutes, and again in fifteen minutes to 2.0 c.cm. (32 min.). This latter dose was continued every half hour throughout the day for the first day. The second day 2.0 c.cm. (32 min.) of a 10 per cent solution were given hypodermically every two hours. When the patient could swallow 4.0 c.cm. (64 min.) of the solution in glycerin was given every three hours, and gradually diminished to 2.0 c.cm. (32 min.) twice daily until rigidity had disappeared.

Nietert and Amyx (St. Louis Medical Review, Dec. 30, 1897) report four cases of tetanus treated with injections of carbolic acid,

one of which recovered. A 2 per cent solution was used, and the injection ranged from 0.7-2.0 c.cm. (10-32 min.). In none of the cases did poisoning symptoms appear.

CHINOSOL.

(Oxychinolin sulphonate of potassium.)

$$2(C_9H_6NO.SO_3K)+H_2O.$$

A chemical compound of potassium pyrosulphate and oxychinolin with alcohol; occurs as a fine yellowish powder, soluble promptly in any proportion of water.

Antiseptic and styptic, a disinfectant, deodorizer and bactericide, recommended on the authority of Emmerich and Kossmann (Munich), Osterman (Hamburg), Dunn and Hobday (London), and many others, as superior to carbolic acid, corrosive sublimate, creolin, lysol and similar products. Indicated in minor surgery, obstetric and gynecologic practice, dermatology, and useful for disinfection of the hands, as a deodorizer in sick-rooms, etc; also reported favorably in veterinary practice. Appears to be very popular in

European countries, but not generally introduced in this country.

Employed in aqueous solutions varying from 1 to 50 to 1 to 1,000 in strength.

CHLORALAMID.

(Chloral-formamid.)

$CCL_3CH.OH.CONH_2$.

Chloralamid occurs in colorless, odorless crystals, with a salty taste; soluble in 20 parts of water, and in 1½ parts of alcohol.

Hypnotic, in 0.5-1.0 gm. (7½-15 gr.) doses, given in solutions or a teaspoonful of whisky or brandy. For a good solution dissolve 2.0 gm. (30 gr.) in 15 c.cm. (4 dr.) Tr. cardamon. comp. and add 15 c.cm. (4 dr.) syrup (orange or raspberry). Sleep is produced within half an hour, and lasts six or more hours. Chloralamid has been recommended as a safe and efficient hypnotic by such authorities as W. Hale White, Wood, Wilcox, Aulde, etc. Conkling (Therap. Gaz., September, 1894) found it a valuable remedy for night sweats of tuberculosis, but his report has found no notable confirmation.

Chlorobrom, a mixture of 2.0 gm. (30 gr.) each chloralamid and bromide potassium in an ounce of water, is very popular in England as a hypnotic, and particularly as a remedy for seasickness.

CHLORALOSE.

(Anhydro-gluco-chloral.)

$C_8H_{11}Cl_3O_6$.

A mixture made by heating together chloral and glucose; occurs in fine, white, needle crystals, bitter in taste. Soluble in 170 parts cold water, more readily in warm water and in alcohol.

An hypnotic and analgesic, in 0.2-0.5 gm. (3-7½ gr.) doses, with 1.0 gm. (15 gr.) maximum, the latter being easily harmful under unfavorable conditions. Introduced by Henriat and Richet, and favorably reported on by Fere, Maragliano, Rossi and others, while Lang stated that it was unreliable and always dangerous. The earliest American report appeared in the Boston Medical and Surgical Journal, June, 1893, and exhibited a favorable clinical record. The reports since then have

been few, showing plainly that the product is not much used, and probably also that it has no advantages over other chloral compounds. Tyson is the only American authority favorable to chloralose, as shown by his report in the Univ. Med. Magazine, December, 1896, and the recent additional report to the A. M. A.

CHLORETONE.

(Tertiary trichlor-butyl alcohol.)

$HO.C(CH_3)_2CCl_3$.

Hypnotic, analgesic, general and local anesthetic, and antiseptic. It belongs to the fatty-acid series and is formed by the slow action of caustic potash on equal weights of chloroform and aceton. It is a white crystalline compound of camphoraceous odor, soluble in ether, strong alcohol, chloroform, acetone, benzin, etc., but soluble only to the extent of 1 per cent in cold water.

In cases of lacerated wounds, burns, etc., it is very efficacious in lessening pain when the injured parts are freely bathed in aqueous solutions of the drug. Owing to its antiseptic

properties, it may be used independently as a surgical disinfectant, or if a strong antiseptic action is desired, it can be employed in conjunction with mercuric chlorid, carbolic acid, etc. Pain and uncontrollable vomiting of gastric origin may frequently be relieved very quickly by its internal administration. In one instance the drug proved especially useful in checking the persistent vomiting of gastric carcinoma. Laboratory experiments quite conclusively show that it renders the mucous membrane of the alimentary canal insensible to irritants. (Houghton.)

As a hypnotic, chloretone is frequently efficacious in various conditions. Especially good results have been obtained from the exhibition of the drug in cases of persistent insomnia in the aged; also in cardiac disease with renal complications accompanied by high arterial tension. Occasionally, when large hypnotic doses have been given, drowsiness occurs on the following day. From 0.4-1.3 gm. (6-20 gr.) at a single dose, followed by a drink of water or milk, seems to be quite sufficient to produce the desired results. (Aldrich.)

Clinical experience has confirmed the reports of the value of chloretone as an analgesic, gastric sedative, hypnotic, and, to a greater or less extent, as a general anesthetic. T. A. Dewar praises it highly as a local anesthetic, analgesic and antiseptic, and reports (Therapeutic Gazette, February, 1900) five cases in which he used chloretone for these purposes, applied as crystals and in saturated aqueous solution to wound surfaces; and one case in which, after the urethral injection of chloretone solution, he was able to pass a larger sound than the sensitive canal would otherwise have admitted.

Chloretone is unquestionably a decided peripheral anesthetic, applied hypodermically or to the surfaces of wounds. It is recommended for use by infiltration in operative work. It has been reported to the writer, however, that, employed thus, it is apt to produce dry sloughing of the skin at the center of each infiltration area.

Unfavorable reports have lately appeared upon the use of this remedy, especially one by R. D. Rudolph, in the Canadian Practitioner and Review, June, 1900.

CITRIC ACID.

Citric Acid has recently been recommended in the treatment of ozena and rhinitis.

Hamm, in Muench Med. Wochenschr., gives his conclusions in the treatment of ozena with a mixture of equal parts of citric acid and milk sugar. This powder was insufflated into the nose morning and night.

Somers, in Therapeutic Gazette, secured the best results when using milk sugar four parts and citric acid one part, and used by insufflation twice daily. The fetid odor accompanying rhinitis promptly disappeared.

CITROPHEN.

(Phenetidin Citrate.)

$C_3H_4(OH)\ (CO.NH.C_6H_4OC_2H_5)_3$

Citrophen is a chemical compound of paraphenetidin and citric acid, hence closely allied to phenacetin, lactophenin, etc., and possessing about the same properties as these older and more popular drugs. Occurs as a white crystalline powder, having an acidulous taste, which property is claimed to make the drug

especially palatable; soluble in about 40 parts of water.

Antipyretic, anti-neuralgic and analgesic, in doses of 0.5-1.0 gm. (7½ -15 gr.) for adults. Introduced on the clinical report of Benario (Deutsche Med. Wochenschr., Nos. 26 and 39, 1895). Hamberger (Nouv. Rem., Dec. 8, 1897) reported good antipyretic effect from 0.5 gm. (7½ gr.) doses in tuberculosis; also excellent results from four 0.5 gm. (7½ gr.) doses daily in acute rheumatism. Friser (Wiener Med. Presse, Nov. 5, 1899) gave a clinical record of thirty-six cases of neuralgia, neurasthenia, migrain, hysteria, morphinism, etc., praising its sedative anti-neuralgic and mild hypnotic effect. Numerous minor indorsements have been supplied lately through the activity of the agents, but no thoroughly decisive investigations by authorities are available.

COLD AND HEAT.

Cold and heat as remedies are gaining more and more in usefulness, as we learn to know more of pathology, and as clinical data become more thoroughly recorded and discussed.

Cold, as a local anesthetic in the form of ethyl chlorid, is discussed elsewhere in this work, and can, therefore, be disposed of here with its mention.

The modern treatment of sprains with cold and heat is so satisfactory and the theories for their employment so rational that no better example can be chosen to illustrate their indications as therapeutic agents. The acute inflammation coincident with a sprain is first combated by the local application of ice. This causes a contraction of the blood vessels, with immediate diminution of blood supply to the part, besides a decrease in the exudation and diapedesis, not to mention the direct anesthetic effect of the cold. As the pain is thus relieved and further swelling and exudation is prevented, we have all the temporary indications met. When the acute inflammation has subsided, which does not take many hours if the ice bag has been conscientiously refilled, indications change.

We have now before us a joint or tissues more or less filled with exudate, which, acting mechanically, causes stiffness, pain on motion, etc. Heat, in the form of dry, hot air, at as high a temperature as from 250° to 400° F.,

will now be found the best means of stimulating both the vessels and lymphatics, thereby hastening the dissolution and absorption of the products of the previous inflammation. Massage in line with the lymph-flow will further aid this process of absorption and speedy recovery will result.

The local application of cold will be found similarly beneficial in all sorts of local inflammations and hyperemias, with or without pain, and as the cold has besides a very beneficial effect on the nervous system, it is used with the greatest comfort in pleurisy, appendicitis, pericarditis, tonsillitis, in the beginning of acute meningitis or in cerebral hyperemia.

The application of cold, in the form of either the tub bath, as recommended by Brand, and accompanied by constant friction, or as cold sponging, has been found so beneficial in all diseases with pyrexia and hyperpyrexia that very little need be said in its favor. In typhoid fever, pneumonias, pleurisy, meningitis, phthisis and the exanthematas, cold is now considered indispensable and there are very few, if any of the leading therapists who have not discarded the hot poultices, cotton-batting jackets, etc., that formerly were considered indis-

pensable in, for example, pneumonia. Vascular or capillary stagnation of the blood, which results from the toxemia of various infectious diseases, is improved by the application of cold, which primarily contracts the cutaneous arterioles and capillary vessels, driving the blood to the deeper vessels which react secondarily increasing the vascular area of the skin. That there is an increase in the elimination of toxic material from the blood after a bath is proven by the increase in quantity and toxicity of the urine. This is furthermore proven by the relief of the nervous and mental symptoms, as well as the pyrexia resultant from the excitant effect of these toxic products upon the nerve-centers. Delirium, muscular twitchings and other manifestations of nervous excitability are relieved, and the patient usually gets rest and sleep after a thorough bath. In pneumonia, where the chief danger lies in the extraordinary work thrown upon the heart, the cold bath acts indeed as a life-saver; besides, the application of the ice-bag relieves the pain and slows the heart's action.

The cold bath acts, as we see, in several ways; first, by directly abstracting heat; sec-

ond, by stimulating the cutaneous circulation and glands; third, by relieving the vascular stagnation, whereby the elimination of toxins is increased; fourth, by diminishing the production of heat or thermogenesis. There need be no fear that in the exanthematous fevers the eruption is "driven inward," as our mothers used to say, by cold, as experience has proven that cold baths are our surest aid in scarletina, rubeola and even smallpox.

CREOLIN.

Creolin is a solution of crude cresols; a dark brown, alkaline liquid, soluble in water —forming a constant emulsion.

A disinfectant, in 5 to 10 per cent aqueous solution; particularly useful for stables, closets, cellars, cesspools, etc. Also useful as sheep-dip and as wash for domestic animals. Creolin is not used in surgery.

CREOSOTAL.

(Creosote Carbonate.)

A chemical compound of pure beech-wood

creosote with carbon dioxid, forming a neutral body, bland and oily to the taste, odorless, non-irritant, and absorbable in large doses without deranging the stomach. It contains 90 per cent of pure creosote.

An intestinal antiseptic, and a superior, palatable and efficacious substitute for creosote in all cases in which the latter is therapeutically indicated. Recommended for tuberculosis, pneumonia, enteritis, ulcerations, and other diseases of the respiratory organs and alimentary canal, whooping cough, typhoid fever, rheumatoid arthritis, etc., by Dujardin-Beaumetz, Hesse, Whittaker, Goldman, Fischer, L. Bayer, A. H. Smith, Jacob Hoelscher, etc.

Dosage, commencing with 0.18 c.cm. (3 drops) 3 times daily, increasing by one drop per day to 1.54 c.cm. (25 drops) for adult dose; best administered in milk, wine, coffee, with the yolk of an egg, etc. For children, in cod liver oil, or with yolk of egg, 0.1-0.30 c.cm. ($1\frac{1}{2}$-5 drops) at a dose, according to degree of toleration. Creosotal should be rendered fluid by warmth before administering.

CREOSOTE.

A mixture of phenols, obtained during the distillation of wood tar derived from beech wood. Its components are principally guaiacol, creosol and various other phenols. Because of its supposed worth in tubercular troubles and its destructive action upon the functions of the stomach when given internally, it has been combined with numerous other substances, in some instances there being chemical union, but in most instances the products being merely mechanical mixtures. Fortunately for the patient, the use of creosote has given away to other and more rational treatment for tuberculosis.

The rationale of its use in tuberculosis is as follows: Its effect is said to be mainly upon the mucous membrane, where it has a sedative action on the nerve filaments, and stimulates the glands by which it is eliminated. It renders the secretions more or less antiseptic according as more or less is administered. This action suggested creosote in intestinal disturbances of various kinds. If creosote be administered in small doses and in minute subdivisions much of the gastro-intes-

tinal disturbance can be avoided. As the remedy is eliminated through or by the mucosa, it follows that the quantity administered per diem will be as efficacious if given in repeated small doses as if given less frequently and in greater quantity pro dosi, and the caustic action resulting from the remedy coming into contact with circumscribed portions of the mucous membrane will be avoided.

CUPROL.

A nucleid of copper, containing 6 per cent of the latter, prepared by Karl Schwickerath. It exists in the form of a green powder; is readily soluble in warm water. Its solution does not coagulate albumin, and is not precipitated by alkalies, etc. (N. Y. Med. Jour., Sept. 30, 1899.) See Mercurol.

DERMATOL.

(Bismuth subgallate.)

Dermatol appears as an odorless, tasteless, yellow powder, which is insoluble. Its use in therapeutics is large and varied, being ap-

plicable externally whenever iodoform is indicated, as well as internally as an antifermentative and astringent.

It is especially recommended for application to severe burns, ulcers, moist eczema; (Weimer) in ophthalmic practice, in kerato-conjunctivitis, conjunctivitis scrofulosa, keratitis parenchymatosa, corneal ulcers (Roselli), as a hemostatic in dental surgery (Hecht), as a dusting powder, either pure or mixed with powdered starch or French chalk, to wounds of all kinds; in the nursery for irritation of the skin, in ointments or as a gauze. It decreases the secretions, arrests hemorrhages, promotes healthy granulation by protecting the surface with an artificial scab; useful in gynecological surgery (Gottschalk) and in rhinology when there are hemorrhages following operations and the application of the galvano-cautery. Finally, in diarrheas, dysenteries, intestinal fermentation, gastric ulcers, etc. (Flint.)

Dermatol, being non-toxic and non-irritating, its action is not accompanied by the untoward effects often following the use of iodoform. Externally it can be applied without stint, while internally it is given in powder,

capsule or tablet, in doses of 0.25-0.5 gm. (4-7½ gr.) or more frequently during the day.

DIABETIN.

(Levulose, Fruit-sugar.)

$C_6H_{12}O_6$.

Diabetin is present, with glucose, in the juices of most sweet fruits and in honey. The commercial product is obtained from molasses, and occurs as a white, brittle mass, having a pure, sweet taste, and readily soluble in water.

Recommended for diabetes, to be used in place of sugar in the preparation of foods, beverages, etc. Considerably used at time of introduction—about ten years ago—but not much mentioned in current literature.

DIONIN.

Ethyl-Morphin hydrochlorate.

$(C_2H_5O.(OH)C_{17}H_{17}NO.HCl+H_2O)$

Dionin is the hydrochlorid of the mono-ethyl-ester of morphin. It appears in a white

crystalline powder, partly soluble in water and in syrup; more soluble in alcohol, but insoluble in ether and chloroform. It has somewhat the same narcotic properties as morphin, and is used in cough accompanying phthisis, bronchial affections, pneumonia, etc., and increases rather than decreases the expectoration.

The dose of dionin is 0.01-0.03 gm. ($\frac{1}{4}$-$\frac{1}{2}$ gr.) every four or five hours. It can be used hypodermically like codine, its effect being rather more prolonged. Tolerance or habit are said not to be established by its use.

DIURETIN.

(Theo-bromin-sodium salicylate.)

$C_7H_7N_4O_2Na+C_6H_4(OH)COONa$.

Diuretin is a white, amorphous, hygroscopic powder, readily soluble in water; not to be dispensed with acid, which separates the product.

Used as a diuretic in 1.0 gm. (15 gr.) doses, up to six times daily; children, 0.5-2.0 gm. ($7\frac{1}{2}$-30 gr.) total per day. Recommended for use in scarlet fever.

ETHYL BROMID.

C_2H_5Br.

Ethyl bromid is prepared by distilling a mixture of alcohol, sulphuric acid and potassium bromid, and forms a colorless, limpid, inflammable liquid, having the odor somewhat of chloroform, and a sweetish taste. It mixes in all proportions with alcohol, ether, chloroform and oils, but is not miscible with water. Ethyl bromid should be carefully preserved, care being taken not to expose it to the action of light or air, which causes decomposition into bromin and hydrobromic acid. When it assumes a brownish color it should not be used.

It was first used as an anesthetic by Muelly in 1849 (says Parker in a review in the Physician and Surgeon) and later promoted by Montgomery, Turnbull and Hammond. The mode of use is to pour 7.3 c.cm. (2 dr.) on a folded towel and apply to nose, excluding air; anesthesia ensues in one-half to five minutes, and lasts up to ten minutes, leaving no after-effect. Parker thinks that it is an ideal anesthetic for general obstetric work and short operations; as safe as ether or chloroform and

devoid of their disagreeable features. His opinion is not shared in by many, for the product is not popular with operators generally.

ETHYL CHLORID.

(C_2H_5Cl.)

Ethyl chlorid is procured by the action of concentrated hydrochloric acid upon alcohol. It is a colorish liquid with a sweetish taste and a penetrating and etherish smell; is extremely volatile sp. gr. when as vapor 2.22. Water dissolves only a small portion, but alcohol mixes with it in all proportions.

Ethyl chlorid is used as a local anesthetic and is sold in conveniently fashioned tubes. Anesthesia is secured by directing a fine spray upon the part, which quickly loses sensation because of the freezing.

Dr. James P. Tuttle, in a paper recently read before the New York County Medical Association, gives his experience with ethyl chlorid, preceding the administration of ether to procure complete anesthesia, and declares that when so given there is insensibility to

pain, complete relaxation, easy and rapid anesthesia, freedom from disagreeable or dangerous after-effects; that after using it in more than fifty cases in connection with ether, without an unfavorable experience, he regards it as a much more desirable method than when ether is administered alone. There was complete anesthesia in five and a half minutes.

The method employed was as follows:

A graduated tube of pure ethyl chlorid with a larger aperture than ordinarily employed was used by spraying on the under surface of an Esmarch chloroform inhaler, which was covered with several layers of gauze and placed over the nose and mouth. As soon as the patient became insensible to the prick of a needle or the touch of his conjunctiva (usually three minutes) the ether was administered with the Ormsby ether inhaler until anesthesia and relaxation was complete. It required, according to Dr. Tuttle, about five and a half minutes to accomplish complete anesthesia.

There was no shock, vomiting or nausea; besides, a very small quantity of ether was needed. Complete recovery usually occurs in ten minutes.

EUCAIN OR BETA EUCAIN.

The hydrochlorid of benzoyl-vinyl-diacetonal-kamin.

($C_{15}H_{21}NO_2HCl$.)

Although considerable literature has accumulated recently with reference to this drug, it has consisted chiefly of reports of its adaptability in various dental, rhinological, laryngological, ophthalmological and major surgical operative procedures. The most scientific data on the subject date back to 1898, and are to be found in the papers of H. Braun of Leipsic and Paul Heintze of Dresden. Their studies controvert the teachings introduced by Schleich with his three infiltration-anesthesia formula, and demonstrate that even in the infiltration method the anesthesia depends for its success upon the specific action of nerve-filament paralyzants. Solutions of the same specific gravity as the tissue-fluids are the only ones which can be employed without disturbing osmotic effects (imhibitory or dehydrating). Solutions of proper specific gravity ("isotonic concentrations," De Vries) contain, according to Heintze, 0.9 per cent of sodium chlorid. Braun recommended for in-

filtration purposes a formula widely employed: Eucain, 1; sodium cholorid, 8; distilled water, 1000. The freezing point of this mixture is 0.535° C. It is, practically, an osmotically indifferent fluid; not irritant; and anesthetic within ten minutes to tissues directly infiltrated. Braun twice used over 300 c.cm. of this solution in operative work. The spread of anesthesia beyond the directly infiltrated area is slower and more imperfect with eucain than with cocain.

For ordinary injection or for application to mucous membranes, eucain solutions may be prepared in distilled water, without sodium chlorid, and may be boiled without injury. They have, thus, been most commonly employed in 2 per cent strength, but frequently in stronger solutions.

Barker (Lancet, Feb. 4, 1899; Jan. 20, 1900) reports a long series of major operations performed under eucain anesthesia. These include herniotomies, intestinal resection, gastrorrhaphy, empyema, and bone operations. He emphasizes the desirability of infiltrating all the accessible tissues, and warns against unnecessary pulling on the omentum or mesentery in abdominal section and herni-

otomy. Lilienthal has drawn attention to the freedom from pain with which the abdominal viscera can usually be manipulated, but has found that the ligation of blood vessels not lying in the injected zone is nearly always painful. He reports successful operation for empyema of the pericardium under eucain anesthesia, and, like Barker, has employed it in a wide range of operations, major and minor. Gessner's arm amputation under eucain has already been reported in the Journal of the Association (Dec. 2, 1899).

Eucain solutions have proven satisfactory in the anesthetization of the mucous membranes of the urethra, and of the nasal and buccal cavities. For tonsillotomies, Dawbarn prefers it to cocain because it does not shrink the mass to be removed. In dental work eucain crystals have been employed for the painless removal of pulps. Willy Meyer and Guiteras have employed injections into the neck of the bladder of eucain solutions of 3 and 4 per cent strength, respectively, for the performance of Bottini's operation. Th. Rosenheim, Berlin, recommended the use of 3 per cent solutions for esophageal injection in cases of malignant stricture, to relieve dysphagia.

EUDOXIN.

Tetra-iodo-phenol-phtalein Bismuth.

(52.9 per cent Iodin; 14.5 per cent Bismuth.)

This drug, a bismuth salt of nosophen, is an intestinal antiseptic. Being relatively non-toxic, it has commended itself especially for the treatment of infantile diarrheas. In the acid medium of the stomach the bismuth is separated from it, but the nosophen is passed on to the intestines unaltered. Here it is changed into its sodium salt, antinosin, which latter exerts an antifermentative and antiseptic influence. The adult dose is 0.2-0.5 gm. (3-7½ gr.); for infants, 0.064 gm. (1 gr.) or less. Eudoxin has not replaced the older and more tried intestinal antiseptics, but is merely added to a list of drugs all more or less valuable, depending upon the actual condition to be dealt with.

EUPHTHALMIN.

The hydrochlorid of (n)methyl-vinyl-diacetone-alkamine-phenyl-glycolyl.

($C_{16}H_{25}NO_3.HCl$.)

A synthetic alkaloid that has chemically the same relation to eucain as homatropin has to tropacocain; that is, euphthalmin is the hy-

drochlorid of the mandelic acid derivative of eucain B. It is a white crystalline powder, readily soluble in cold water. Its solutions may be boiled without injury, and they deteriorate but slowly.

Euphthalmin was introduced into ophthalmic practice in 1897 by Treutler, who found it to be a strong mydriatic, acting quickly and without unpleasant effects. Subsequent reports from competent observers confirm Treutler's findings, and are, in the main, uniform concerning the advantages and uses of the drug.

Euphthalmin has been used in solutions varying in strength from 1 to 10 per cent. Solutions of 2 per cent strength were found by most observers to require too many instillations for convenient work. Five per cent is the strength of solution most commonly employed; sometimes 8 or 10 per cent. After a single instillation (of one, two or three drops) of a 5 per cent solution, mydriasis begins in about twenty minutes, reaching its maximum in thirty to forty-five minutes. In people of more advanced age, mydriasis is not so promptly obtained as in young patients. Ten per cent solutions take effect about 6

minutes sooner and mydriasis is completed also about six minutes earlier than with the 5 per cent solution. The instillation produces but ephemeral discomfort, sometimes none at all. There is no irritation of the conjunctiva, cornea or skin. (There is no perceptible effect on the visible blood vessels, except occasional brief injection after the use of the stronger solutions; microscopic examinations of rabbits' cornea show absence of epithelial changes after its use.) No toxic symptoms have developed. In these respects euphthalmin possesses advantages over atropin, cocain, duboisin and other mydriatics. It does not affect sensibility.

With the maximum mydriasis (to 8 mm.) there exists maximum loss of light-reflex. Even in strong sunlight the pupil remains well dilated, which does not obtain after cocainization. Mydriasis begins to disappear in the second hour, being lost generally in about three hours. All effects of the drug disappear in hours variously stated at from six to twenty-four.

Euphthalmin has been frequently used in glaucomatous eyes, although it has not been universally admitted that it can be relied upon

as free from all danger of increasing intra-ocular tension.

Euphthalmin's chief advantage lies in the absence of distressing cycloplegic effects. During the entire duration of its action, reading and writing may be indulged in without difficulty. The point of distant vision is not disturbed. Accommodation is so little affected that the average maximum advancement of the near point of vision is 2″ or less, and this only for forty-five minutes to one hour. A maximum advancement of the near point of vision of 5½″ has been obtained after the use of a 10 per cent solution. In people of over 40 years there may be no displacement of the near point of vision; and at all ages 2 per cent solutions scarcely affect accommodation. The cycloplegic effects of atropin, on the other hand, last eight to ten days, and 1 per cent homatropin solutions cause paralysis of accommodation for twenty-four hours.

EUQUININ.

(Euchinin.)

(Ethylcarbonic ester of quinin.)

$C_2H_5O.CO.OC_{20}H_{23}N_2O.$

Occurs in white crystals, insoluble in water,

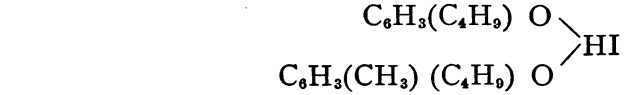
but soluble in alcohol and ether. The hydrochlorate (soluble) and tannate (insoluble) are recommended for use.

Euquinin (or euchinin) was primarily introduced as a substitute for quinin, having the advantage of being tasteless. It has been used extensively in the malarial districts of Italy, and reports are favorable. The original report that it does not cause cinchonism has been authoritatively contradicted. The dose is the same as of quinin, the only advantage being its tastelessness; and as it is very expensive, it can hardly be considered a formidable rival for the present. It has also been highly recommended for whooping cough, in hectic fever of phthisis, and in fever of septic origin (Cassel, of Berlin, and v. Noorden, of Frankfort.)

Dose is 1.0-2.0 gm. (15-30 gr.) for adults; children proportionately less, best given dissolved in water or milk.

EUROPHEN.

Di-isobutyl-ortho-cresol-iodid.)



Europhen is a yellow amorphous powder

with a pleasant aromatic odor, containing 28.1 per cent of iodin. It is insoluble in water, but easily soluble in alcohol, ether and fatty oils.

Among the large number of iodoform substitutes which have been brought forward, europhen seems assured of a permanent place in the materia medica. It liberates its iodin when applied to moist surfaces, and has a large covering capacity. No cases of toxic effects from its use have been reported; it is also claimed to be free from irritant effects. In the more recent literature attention has been more especially directed to its value in the treatment of cystitis, prostatitis and chronic urethritis.

Dr. W. F. Waugh (Merck's Archives, October, 1899) reports successful use of a formula consisting of 4.0 gm. (1 dr.) europhen with 32.0 gm. (1 oz.) fluid petrolatum in endometritis, a few drops of this mixture being injected into the uterine cavity; favorable results are also reported from the application of this formula in the treatment of chronic urethral prostatic troubles. Dr. G. H. Thompson (American Journal of Surgery and Gynecology, September, 1899) reports europhen equal to iodoform in local therapeutic action,

and employs it in gynecological work, especially in chronic inflammatory conditions, and also as a dressing for operative wounds. Dr. D. A. Richardson (Medical Review, Feb. 10, 1900) reports excellent results from injections of europhen in olive oil in cases of chronic urethritis, prostatitis, and cystitis. It is said to act here as elsewhere, through the liberation of iodin, thereby destroying infection and exerting an absorbefacient influence upon the exudates.

Europhen has been recommended in the treatment of pulmonary tuberculosis, applied in inunctions, and also administered internally. Dr. Otis (Boston Medical and Surgical Journal, July 21, 1898) states that iodoform used as such or in the form of its substitute, europhen, has a beneficial effect in phthisical cases, by improving the appetite, increasing the weight, and diminishing the cough. Dr. Floeckinger, whose first report on the treatment of tuberculosis with inunctions of europhen appeared in 1897, has since published his later experience in the Therapeutic Gazette, Jan. 15, 1900. From his experience, now extending over five years, he claims europhen inunctions to have a curative

effect upon tuberculosis, and that in the early stages of the disease the drug is practically a specific.

EXALGIN.

(Methyl-acetanilid.)

$C_6H_5N\ (CH_3)\ (CH_3CO.)$

Exalgin is an acetanilid compound, occurring in the form of a white, crystalline powder; taste, salty; soluble in 60 parts of water, and freely in alcohol.

An analgesic in 0.2-0.4 gm. (3-6 gr.) doses in neuralgia and rheumatism; antipyretic in 0.5 gm. ($7\frac{1}{2}$ gr) doses, but not particularly safe, many cases of untoward side-effects having been reported. Loewenthal recommends it in 0.2 gm. (3 gr.) doses thrice daily for chorea, but its action should be carefully watched.

FERRATIN.

Synonym: Ferri-albuminic Acid. A definite chemical compound of albumin and iron tartrate, discovered by Schmiedeberg (Strassburg), containing about 7 per cent iron in or-

ganic combination. It is a brownish-red powder, soluble in water.

Ferratin has been thoroughly tested physiologically by Schmiedeberg, Filippi, Vay, Cloetta, Fackler, Chittenden, etc., the result proving that it is absorbed readily, deposited in the liver, spleen and bone-marrow (not in the kidneys), and from there utilized for blood formation. Ferratin is identical with the organic form of iron as absorbed by the system from animal and vegetable food; it can be experimentally isolated, for instance, from spinach, from pig's liver, etc., by simple maceration with water, heating to boiling point, and precipitating by addition of tartaric acid solution (10 per cent) after cooling. Franz Vay (Zeitsch. f. Physiolog. Chemie, Bd. XX, Heft 4, Feb. 1895), isolated ferratin from human livers by the same process, utilizing the organs of recently deceased children and adults obtained at a morgue. Fackler voices the conclusions of all, in saying (Cincinnati Lancet-Clinic, April 7, 1894): "The physiological and therapeutic importance of ferratin is based upon the fact that, after absorption, it is immediately available, while other compounds of iron, including the simple albuminates, must

first be changed into ferratin in order to become active agents."

Therapeutically ferratin is indicated in anemia, chlorosis and all diseases due to impoverished blood conditions. It is promptly absorbed, and quickly increases the red blood-corpuscles and thereby the oxidizing power of the blood. A particular advantage of ferratin administration, besides being readily accepted by the weakest and most delicate stomach, causing no functional disturbances, and not affecting the teeth, is that it at once and markedly improves the patient's appetite; this is of special importance in treating children, anemic young women, convalescents, etc. Ferratin has been clinically tried and favorably reported on by Jacquet, Harold, German Seé, Einhorn, Fütterer, Wiener, Deutsch, Cumston and others.

Dose, 0.5 (7½ grains) for adults, 0.1 to 0.3 (1½ to 5 grains) for children, three times daily, shortly after meals; best administered in powdered form, added to milk, cocoa, beer, wine or other beverage.

FERRINOL.

A nucleid of iron, containing about 6 per

cent. of the latter, prepared by Karl Schwickerath. It exists in the form of a cinnamon-brown powder; is readily soluble in warm water, with neutral reaction; does not coagulate albumin, and is not precipitated by the ordinary reagents for iron. The iron is here present in a stable organic combination, which should render the product valuable when prompt absorption is desired. (N. Y. Med. Jour., Sept. 30, 1899.) See Mercurol.

FORMALDEHYD.

(Formic aldehyd.)

$H.CO\,H + H_2O$.

Antiseptic, germicide, disinfectant and deodorizer. It has been so well known of recent years, and so much has been written of it, that only conclusions are to be expected here.

1 to 125,000 kills anthrax bacilli.

1 to 50,000 prevents development of typus bacilli, etc.

1 to 32,000 preserves milk for several days.

1 to 25,000 forms useful injection in leucorrhea, etc.

1 to 20,000 preserves wine, weak alcoholic liquids, beer and milk for several weeks.

1 to 4,000 recommended for moistening paper used to cover jam, etc.

1 to 3,200 for rinsing dairy vessels, etc.

1 to 2,500 destroys the most resistant microorganism in one hour.

1 to 2,000 for rinsing casks and vessels intended for liquids liable to fermentation.

1 to 500 for irrigation of catheters, etc., and for mouth wash.

1 to 250 general disinfectant solution, for washing hands, instruments, etc., in surgery, spraying in sick rooms, and as a deodorant.

1 to 160 to 100 hardens microscopic tissues, which should be immersed for a considerable time to give the best results.

1 to 100 in the treatment of lupus, psoriasis and skin diseases.

1 to 150 to 25 to sterilize catgut, silk, etc., by steeping.

1 to 25 for quickly hardening and preserving microscopic sections; longer immersion in a weaker solution gives better results.

1 to 10 for hardening very firm tissues in pathological and histological work.

Formaldehyd is to be had in 40 per cent. aqueous solution and is miscible with water in all strengths.

Mitchell, British Medical Journal, declares that he has made successful use of formaldehyd for the removal of sarcoma by applying a 20 per cent. solution on absorbant cotton to the bleeding area, covered with gutta percha tissue, and finally a bandage. These applications were renewed every twenty-four hours after removal of dead tissue by curette. There were at times severe pain which had to be controlled by narcotics (local anesthetics, such as orthoform should be used to produce anesthesia before the application of the formaldehyd). There was sometimes the annoyance of edema which, if extending to the glottis, might prove fatal, and finally there developed a urticarial irritation in a few instances.

Formaldehyd is also effective in the treatment of hyperidrosis of the feet, in genito-urinary diseases, whooping cough, diphtheria, the latter two complaints being treated with spray or vapor in 1 per cent. solution; in atrophic rhinitis and ozena, in dilute solutions to be applied after the application of cocain to the mucous surfaces; in 1 to 10 per cent liquid formaldehyd applied to the ulcers of laryngeal tuberculosis.

Amyloform, glutol, dextroform, and a host of antiseptics, compounds of various substances with formaldehyd, depend solely for their powers upon the formaldehyd which they contain.

GELATIN SOLUTIONS.

Gelatin solutions used hypodermatically in the strength of one per cent have lately been used considerably in the treatment of aneurisms and as a hemostatic. Lancereaux, Stoicesco and others claim curative results in aneurisms. The conclusions of Futcher, who has treated nine cases by this method at the Johns Hopkins Hospital are, that, though in no case was the aneurism cured, in one case it was considerably diminished in size and in 7 of the 9 cases there was appreciable diminution in the subjective pressure symptoms.

All writers on the subject seem to agree that a material increase in the coagulability of the blood results from the subcutaneous injection of gelatin solution.

Nietert treated 5 cases of anurism with gelatin solution, and concludes that the symptoms were greatly improved in all of the cases. Pain

was lessened, breathing easier with less pressure. He reports great pain, however, at the site of injection. Freudweiller reports unfavorably two cases of hemorrhagic nephritis treated with gelatin solution, and concludes that gelatin has an irritating action on the kidneys.

Da Costa recommends the introduction of an absorbent cotton plug, saturated with a solution of one part gelatin in 16 parts normal salt solution, into the nose in severe epistaxis. Guttman recommends both the internal adminstration and enemas of gelatin solution in intestinal hemorrhages. Carnot advises the following formula: Gelatin, 12 drams; calcium chloride, 2½ drams; water, 1 qt. As gelatin is a good medium for the development of micro-organisms, great care should be taken to have the solution perfectly steril. From all appearances there seem certainly to be some merit in the treatment, which should be borne in mind when indications arise.

GEOSOTE.

(Guaiacol Valerianate.)

Geosote is a yellowish, oily fluid of the sp. gr.

of 1.037; boiling point 245 degrees C.; a smoky odor and a sweetish, rapidly changing to bitter taste. It is nearly neutral, soluble in alcohol, ether and benzin. This product is reported useful in all forms of tuberculosis, and may be given internally, applied externally, or, as reported by Rieck, by hypodermatic injections directly into the tissues and even into the joint. It is reported useful also in bronchitis, broncho-pneumonia and catarrhal conditions of the larynx, pharynx and the nasal passages, as well as in gastric catarrh. Zinn (Ther. Monets, 1898) reports favorably upon the use of the valerianate of creosote (Eosot) in pulmonary tuberculosis. In some instances he reports the remedy was given continuously for several months. There was no gastric or intestinal disturbance. It was well borne and met all the requirements of an antitubercular remedy.

Wainwright (Langsdale Lancet) reports favorably in a number of cases of phthisis treated with geosote, as does Stubbert (New York Medical Journal). Finally, Rieck, in the article previously quoted, reports serviceable applications of geosote in two cases of lupus.

The dose is 0.2 - 0.6 gm. (3 - 10 min.) three

times a day. As the remedy has a disagreeable odor, it is best administered in coated capsules.

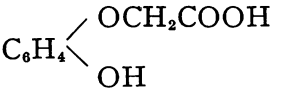
GLUTOL.

(Formaldehyd-gelatin)

Glutol is a mixture of gelatin (500 gm.) with a 40 per cent solution of formaldehyd (25 drops), which is dried in the presence of formaldehyd vapor. The resulting substance is a hard, clear, transparent mass, which is dried and powdered. This powder is used as an antiseptic dressing powder.

GUAIACETIN.

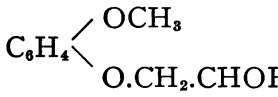
(Pyrocatechin-mono-acetic acid.)



Guaiacetin is obtained by the action of chloro-acetic acid on pyrocatechin. It is a white, inodorous powder, soluble in water, and is recommended as a substitute for guaiacol in

phthisis and other complaints in doses of 0.5 gm. (7½ grs.), preferably in capsules.

GUAIAMAR.



Guaiamar is a glycerol ether of guaiacol, occurring in the form of a white, crystalline powder, soluble in 12 parts of water, and more readily in alcohol.

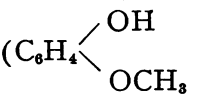
Intestinal antiseptic and recommended as a preferred form of administering guaiacol in phthisis. This is an American product; only one report has appeared, so far as available, and that by Butler, of Chicago, who tested it extensively and recommends it very highly as uniformly valuable in the treatment of typhoid fever.

Dose, 0.3-1.3 gm. (5.20 grs.), before meals. Butler offers the following formula as best adapted for administering the drug: Guaiamar, 24.0 gm. (6 dr.); glycerin, 40.0 gm. (10 dr.); alcohol, 24.0 gm. (6 dr.); water, 64.0 c.cm. (2 oz.); take half to 2 teaspoonfuls at a time.

Despite this favorable introduction, guaiamar is not heard of in the medical press.

GUAIACOL.

Methyl-pyrocatechin.



Guaiacol is obtained by fractional distillation of beechwood creosote, which consists of from 60 to 90 per cent of guaiacol with creosols and cresol, making up the remaining per cent. It is also prepared synthetically as well as by the dry distillation of guaiac resin. When pure it is in the form of crystals which melt at 28.5 degrees C. It has an agreeable aromatic odor, and is soluble in 85 parts of water, freely so in alcohol and ether.

Like creosote, guaiacol is used principally in tubercular affections, and like creosote it has proven so destructive to the digestive function that it is no longer used to any considerable degree. A great many combinations have appeared, among them the guaiacol carbonate and the guaiacol benzoate. These will be found preferable for internal administration to guaiacol. The application of guaiacol in 20 per cent to 40 per cent solution in oil, for erysipelas has been found to reduce the temperature, and favorably influence the disease.

It has also been found serviceable in gonorrheal epididymitis applied as an ointment with lanolin.

It is claimed that the good effects following the use of both guaiacol and creosote in the treatment of pulmonary tuberculosis are not due to their "development hindering" properties as the earlier experimenters believed, nor to a stomachic and tonic effect, but to their forming soluble chemical compounds with the toxic albuminous compounds, the by-products of bacterial life, and that these compounds are easily eliminated through the secretions. The fever, night sweats, functional disturbances, etc., are thought by the same investigators to be due to these same toxic albuminous by-products, and consequently, by their elimination general improvement follows.

Like creosote, guaiacol has been found serviceable in gastro-intestinal disturbances through its antifermentation and antiseptic properties. It has also been quoted as efficacious in the treatment of certain skin diseases, more particularly those depending upon parasites.

Many derivatives of guaiacol have been of-

fered, the more prominent being guaiacol-benzoate, guaiacol carbonate, guaiacol biniodid, cinnamyl-guaiacol, salicyl-guaiacol, etc.

GUAIACOL CARBONATE.

(Duotal.)

$[CO_3(C_6H_4OCH_3)_2.]$

Guaiacol carbonate is a white, crystalline, neutral powder, with but little taste or odor. It is insoluble in water, sparingly so in cold alcohol, glycerin and oils.

It is used as a substitute for guaiacol and creosote in tuberculosis. It is not affected by acid solutions, but is readily decomposed in alkaline solutions; to this property is its lack of gastric disturbance due. There is said to be increase of appetite and bodily weight in those using the remedy; a diminished cough and repair of the pulmonary lesions. Those who cannot tolerate creosote or guaiacol take the carbonate readily.

The dose is from 0.2-0.5 gm. (3-7½ gr.) increased to 6.0 gm. (90 gr.) pro die.

HEROIN.

(Diacetic ester of morphin.)

$$C_{17}H_{17}NO_3\begin{cases}CH_3CO\\CH_3CO\end{cases}$$

It is a colorless, inodorous, crystalline powder, with a slightly bitter taste, insoluble in water, soluble in dilute acids and precipitated by alkalies. The hydrochlorate of heroin is the product in use.

Since the first investigation of heroin by Dreser in 1898, this drug has been so thoroughly studied that a definite opinion as to its therapeutic status is now permissible. Although a morphin derivative, heroin differs from the latter drug in its action upon the respiratory apparatus, in a reduction of the number of respirations, an increase in the volume of inspiration and the force of expiration, together with a general sedative action upon the broncho-pulmonary tract.

It has been chiefly employed in the treatment of coughs and dyspnea. The diseases in which the results have been most favorably reported upon are pulmonary tuberculosis, pneumonia, the various forms of chronic bronchitis, laryngitis, asthma, whooping-cough and

hay fever. Earlier observers stated that heroin caused a reduction of temperature in phthisical cases, besides relieving the cough and securing night rest, but this action has been doubted by other writers.

Cases of nausea, dryness of the throat, vertigo, headache and constipation in some instances have been reported, and the drug appears to be unsuitable to some patients. Dr. M. Manges (New York Medical Journal, January 13 and 20, 1900) states that the maximum daily dose should never exceed 0.016 gm. (¼ gr.) and that the initial dose should never be greater than 0.005 gm. ($^1/_{12}$ gr.), and in weak individuals or the aged preferably 0.0027 gm. ($^1/_{25}$ gr.) As to the occurrence of after-effects he remarks as follows: "The general conclusion is that these effects have occurred in a surprisingly small percentage of cases, when it is borne in mind that in so many instances the larger doses, 0.01 gm. ($^1/_6$ gr.), have been employed. Even the effects which have been recorded are only relatively simple, and in no case was there any serious effect noticed. These after-effects are decidedly of less frequent occurrence and of milder

degree after heroin than those from morphin or codein."

J. R. L. Daly (Boston Medical and Surgical Journal, February 22d, 1900) details his results with heroin in the treatment of phthisical cases. His observations relate to over 100 cases in all stages of the disease. In his opinion, no drug can compare with heroin as a sedative for cough and to prevent the distressing and disagreeable stagnation of secretory products in the lungs, particularly in cases of pulmonary tuberculosis. The dose usually employed was 0.005 gm. ($^1/_{12}$ gr.), but even the larger dose, 0.01 gm. ($^1/_6$ gr.), was well borne, except in a few instances when a feeling of heaviness was produced. Owing to the insolubility of heroin, the hydrochlorid is mostly used. F. C. Floeckinger (New Orleans Medical and Surgical Journal, April, 1900) calls attention to the value of the drug, not only for the relief of cough but also of dyspnea in pulmonary affections and organic diseases of the heart. He prefers heroin hydrochlorid and has never observed gastric disorder from its use. He concludes that we possess in heroin an excellent sedative for the respiratory tract, which is de-

void of the narcotic effect of morphin and codein.

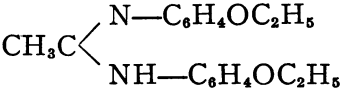
Some experiments have been made with a view of determining whether heroin might not take the place of morphin as a general analgesic, especially as it is free from the unpleasant effects of the latter and the risk of habituation, and these tests have been to a certain extent successful. Heroin hydrochlorid has been employed subcutaneously by Prof. Eulenburg for the treatment of neuralgia, with satisfactory results, and he also recommends its use in the treatment of morphinism as a substitute for morphin.

In the Clinic of von Hacker, of Innsbruck (International Journal of Surgery, May, 1900) heroin is now employed before the induction of anesthesia in alcoholic cases, in order to prevent excitement, and also in the after-treatment of surgical cases for the relief of pains. Heroin possesses local anesthetic influence, according to Dr. Mirtl (Annals of Gynecology and Pediatry, November, 1899), who employed tampons moistened in a solution of the drug for the relief of irritation and pains in uterine affections. This has been recently confirmed by Dr. S. A. Milliken (Alka-

loidal Clinic, April, 1900). Heroin and heroin hydrochlorid must not be given with alkalies, such as bicarbonate of sodium, as these have a tendency to decompose the drug after a time, and might thus impair its activity.

HOLOCAIN.

Holocain is chemically the p-dieth-oxy-ethenyl diphenyl-amidin hydrochlorid.



It is a derivative of para-phenetiden, the sources also of phenacetin and lactophenin. It is insoluble in cold water, sparingly so in boiling water, and freely so in alcohol and ether. It appears in the form of white needles, and when dissolved in water gives a neutral solution which has a slightly bitter taste. In making solutions of holocain care should be taken to use only containers of porcelain, or glass, which has been boiled in hydrochloric acid, as it attacks the alkali if any be present in the glass. It is necessary also to use only dis-

tilled water as the presence of a calcium or other salt is apt to cause the solution to become turbid.

Holocain is used as an ocular anesthetic and in certain nasal troubles; when instilled into the eye it produces anesthesia in from fifteen seconds to a minute, which lasts from ten to twenty minutes. Its advantages over cocain lie in the fact that it does not produce mydriasis, affect the accommodation, corneal epithelium or the intra-ocular pressure (Derby). It is antiseptic (1 per cent acting as a powerful germicide), which fact does away with the necessity of boiling the solution to sterilize it, but boiling does not affect its anesthetic propensities.

Holocain should never be given internally nor used hypodermatically, as when so used it is highly toxic. Wurdemann claims holocain in 1 per cent solution exceeds in anesthetic power a 3 per cent solution of cocain.

Holocain is declared to be the ideal anesthetic for use when removing foreign bodies or for anesthetizing the conjunctiva and cornea for any purpose whatever (Knapp, Gleitsman Jackson). Another superiority over cocain is the fact that it relieves severe and pain-

ful inflammation which resists other remedies. It does not tend to control hemorrhages as does cocain, and this fact is regarded as largely in its favor, as then there is not so much danger of infection by carrying pathogenic bacteria into the wound (Knapp), the flow of blood washing away such sources of infection. Cocain by its action in lessening the supply of blood produces an anemia. Again there is not sufficient resistance of the tissue under cocain anesthesia to execute cutting operations accurately, or to estimate the effect which it will produce (Gleitsman), this is not so when holocain is used. On the other hand, however, the bleeding sometimes interferes with the proper performance of operations. As cocain produces a contraction of the blood vessels followed by relaxation, the surgeon is never secure in his mind as to the probability of secondary hemorrhage.

"Derby" says that in the treatment of suppurative inflammation due to invasion by organism; in ulcus serpens which results from infection of the cornea by micro-organisms giving rise to a purulent inflammation, the germicidal properties of holocain will appeal to the surgeon as the ideal remedy, securing as

it does the dual effect of anesthesia and antisepsis.

HOT AIR TREATMENT.

Acute and chronic rheumatism, traumatic synovitis and sprains, even arthritis deformans and other joint diseases, have of late been treated very successfully by the local application of dry hot air at a temperature of from 250 degrees to 400 degrees F.

After lightly bandaging the joint, or portion of the body requiring treatment, with turkish toweling or other absorbent, the part is either introduced into the "oven" or else, connected thereby through a hood that will lead the hot air directly to the part. Some of the hot air is at first permitted to escape, and the same precautions must be repeated at times, as any moisture will cause blistering which the dry, hot air does not. Each treatment ought to last for about an hour, but this will have to differ in each instance, according to the condition of the heart, etc., of the patient.

There is considerable acceleration of the pulse and usually profuse perspiration, which demands close attention in each individual case. The experience at various hospitals and

numerous reports of cases receiving this treatment from general practitioners, prove the procedure most valuable in various ailments, especially when a temperature of from 350 degrees to 400 degrees F. is employed and when the treatment can be repeated every day or two.

HYPNONE.

(Acetophenone, Methyl-phenyl-ketone.)

$C_6H_5CO.CH_3$.

Hypnone is produced by dry distillation of calcium acetate and benzoate, and occurs as a thick, colorless liquid, of a bitter almond-like odor; soluble in alcohol, but not in water.

Soporific, hypnotic, in doses of 0.06-0.18 c.cm. (1-3 min.), dispensed in capsules or in emulsion; has been recommended in delirium tremens, mental diseases, etc., but so many reports of unsatisfactory and dangerous effects have appeared that it has not become popular.

HYRGOLUM.

This drug, analogous to Credé's water-soluble preparations of metallic silver, is an allotropic form of solid mercury, hydragyrum

colloidale. It was first produced by A. Lattermoser, who obtained it by stirring together dilute solutions of mercuric nitrate and stannum nitrate; the resulting solution of colloidal mercury is then treated with a concentrated solution of ammonium citrate, which precipitates the colloidal mercury. Commercially, hyrgolum, or hydrargyrum colloidale, occurs in the form of small dark crystals of metallic lustre. It is soluble in water, but not completely so, the solutions containing a small insoluble residue. This is due largely to the chemical impurity of the preparation, which contains traces of tin, ammonium, etc.

The drug has been used in various phases of syphilis. It may be administered in solution, pill-form, tablet-form, or by inunction. By the latter method, in 10 per cent strength, hyrgolum has been most employed. Inunctions of this preparation are cleaner and more easily applied than those of ungt. hydrargyri (Werler). Aside from the greater infrequency of local irritant, and unpleasant systemic effects, colloidal mercury, as at present produced, has demonstrated for itself no marked superiority over the established preparations. It is ineligible as an injection. Falk (Deutsche Med.

Woch., XXV., No. 4), reports less favorable results with the use of colloidal mercury than were obtained by Dr. Oscar Werler. The former emphasizes the instability of the solutions of hyrgolum. Gottheil (Intern. Journ. Surgery, Sept., 1899) reports good results with it in infantile syphilis, using a 1 per cent aqueous solution, 3 to 20 drops thrice daily.

ICHTHALBIN.

(Ichthyol albuminate.)

Made by combining ichthyol with albumin, forming a fine gray powder which is odorless and practically tasteless; soluble in alkaline solutions, but insoluble in solutions having an acid reaction. It is said to contain 75 per cent of ichthyol and to be non-toxic when administered internally even in large doses. Employed in intestinal disturbances in doses of 1.0-2.0 gm. (15-30 gr.) daily.

ICHYTHOL.

(Ammonium-ichthyol-sulfonate.)

($C_{28}H_{36}S_3O_6(NH_4)_2$.)

Ichthyol is the product of the dry distilla-

tion of a bituminous substance found in Tyrol, which is rich in the fossil remains of fish. It is a dark, oily substance, soluble in water, glycerin and equal parts of alcohol and ether. Employed externally in chronic eczema, in acne, lupus, entertrigo, in burns, chronic rheumatism and in lymphatic enlargement; and internally in various affections of the intestinal tract, and even in phthisis. The extravagant claims made for ichthyol, however, are rather questionable. Internal dose 0.2-0.6 gm. (3-10 min.)

INFUSION.

(Intra-venous sub-cutaneous and rectal.)

Experience has demonstrated beyond all doubt, that transfusion of blood—be it direct or defibrinated—is always more or less dangerous, as, besides the possibility of clot formation, the red blood cells injected soon disintegrate, causing destruction of the leucocytes with attendant formation of fibrinferment, etc. The infusion of sterile water is equally dangerous, as it dissolves the red cells and is liable to cause speedy death.

A solution of six-tenths of one per cent of

common table salt, or, better still, of the strength of one per cent, will fulfill all practical purposes, though a better formula may be distilled water 1000, Sodium chlorid 6, Sodium Carbonate 1. To this may be added one minim of a concentrated solution of sodium hydrate to each half liter in order to render the solution faintly alkaline. Any of the solutions used should be sterilized by boiling, as well as should the rubber tube, glass cannula, aspirating-needle, and the glass funnel or irrigator. The proper temperature is from 110 to 120 degrees F. as the case may require.

The indications for infusion are constantly increasing. Hare claims that in chloroform narcosis and in shock, where the sympathetic nerves are paralyzed, the tone of the vessels is lost, and therefore, as the heart continues its pumping the patient "is bled into his own veins and capillaries as effectively as if into a bowl." There seems no doubt that infusion of salt solution is under these circumstances our best aid, as practical experience teaches every day. After bleeding points have been secured, in accidents, bloody operations or post-partum hemorrhages, etc.; infusion is an invaluable aid also in certain forms of uremia,

where the poisonous effects of the toxines will be relieved by diluting the blood by means of salt solution.

Howard Kelly declares the infusion of normal salt solution to furnish the quickest and best method of stimulation known, and that it is called for in all cases of hemorrhage. It is also recommended in septic infection, in puerperal eclampsia, in diabetic coma, in extreme cases of diphtheria, typhoid, pneumonia, grave dysentery, peritonitis, in extreme cases of phthisis, etc. It is used by rectum enema subcutaneously and intravenously. Absolute cleanliness should of course be observed.

IODOFORM.

CHI_3

A. H. Ferguson reports (Chicago Med. Recorder, Jan. 1900) a patient on whom he performed an exploratory thoracic operation. A large consolidated tuberculous area was found in the lung. After rib-resection, the mass was walled off by pleural suturing and by packings. Subsequently the consolidated area was submitted to 28 injections of iodoform powder

or iodoform emulsion at intervals extending over a period of about six months. This resulted in a resolution of the local tuberculous process and a relative cure of the patient.

Our interest in iodoform, however, attaches less to the variations of its well-known uses than to the efforts made to rob this compound of its disagreeable features.

The more important substitutes for iodoform are referred to under their proper titles.

An odorless iodoform is advertised by a well-known firm, but since the chemistry of the preparation is not published it has attracted but limited scientific interest.

Iodoformin, prepared by rubbing together 26 gm. of formin (hexa-methylene-tetramin; urotropin) and 74 gm. of iodoform with a little absolute alcohol, is offered as an odorless substitute. On moist surfaces, however, this powder breaks up into its constituents and liberates odorous iodoform.

Creolin deodorizes iodoform, it is claimed, and Vaczi recommends creolin 1 part; iodoform, 2 parts; petrolatum, 25 parts as a mixture for that purpose.

Iodoformogen is a (practically) odorless compound of albumen and iodoform—iodo-

form albumenate. It is a fine, dry, impalpable, light yellow powder, insoluble in water, sterilizable at 100 degrees C., and 3 times lighter than iodoform. Kromayer (who introduced the compound), Mahler, Severeanu and others have reported favorably on Iodoformogen as a succedaneum for iodoform. It possesses the same stimulating qualities, it hastens cicatrization, and because of its fineness and levity is easily introduced into sinuses and cavities. Its voluminousness, moreover, makes it possible to use the powder more economically and therefore with less frequent toxic effects. This and its lack of odor and easy sterilizability are its chief claims for superiority. Severeanu calls attention, however, to the fact that cicatrices after the use of iodoformogen are retracted and hard. He recommends its use for suppressing exurberant granulations in wounds having a keloid tendency.

IODOL.

(Tetra-iodo-pyrrol.)

C_4I_4NH.

Iodol is a product of iodine and pyrrol, oc-

curring as a brownish-yellow powder, odorless, insoluble in water, partly soluble in alcohol.

An antiseptic and alterative; one of the first iodoform substitutes, introduced about twenty years ago, and in continuous though limited use. All reports show it to be an effective substitute for iodoform; applied as a dusting powder, in 5 and 10 per cent ointments in glycerin or collodion and in vaginal tampons.

Recommended in equal parts with tannin and borax as a snuffing powder in ozena, to be used 3 to 5 times daily. Iodol may be given internally in doses of 0.3-0.7 gm. (5-10 gr.) two to four times a day, in wafers, in cases requiring iodin when the effect is unpleasant.

IODOTHYRIN.

Iodothyrin is an amorphous brown powder insoluble in water, but soluble in alcohol. It contains 9.3 per cent of iodin and 0.5 per cent of phosphorus. It is obtained from the thyroid gland of the sheep. Each gram is said to be equivalent in activity to 1 gram of the fresh gland.

Iodothyrin is a triturate with milk sugar and is a useful remedy in the same class of conditions in which thyroid extracts have been generally employed, as in obesity, myxedema and goitre. Sidney Kuh in a report on two unusual cases of myxedema states that under the administration of iodothyrin disagreeable secondary effects were much less marked than when the compressed thyroids were used. In obesity it is asserted that iodothyrin may be given in comparatively larger doses than the thyroid extracts, and for longer periods, without unpleasant effects upon the heart and nervous system.

Lancereaux and Paulesco report good results from iodothyrin in a class of cases which they term rheumatismal, comprising chronic rheumatism, arterio-sclerosis, scleroderma, etc. Jeulain describes a class of cases which he designated as thyroid chlorosis, characterized by the symptoms of myxedema and Basedow's disease in connection with chlorosis. Although no improvement occurred under the ordinary treatment with iron he reports these patients as improved by the administration of iodothyrin. To prevent deleterious effects from thyroid extracts or iodothyrin on certain sus-

ceptible persons L. Mabille advises the administration of arsenic in small doses during its employment.

KRYOFIN.

Methyl-glycollic phenetidin.

$CH_3OCH_2CO.NH.C_6H_4.OC_2H_5.H_2O$.

Kryofin is a product of para-phenetidin with methyl glycollic acid, one of the efforts to improve on phenacetin by replacing its acetic acid radical, as in the case of apolysin, citrophen, lactophenine, etc. Occurs as white, crystalline powder, almost insoluble in water.

Antipyretic, anti-neuralgic, etc., in doses of 0.5 gm. ($7\frac{1}{2}$ gr.) for adults. Recommended first by Eichhorst (Zurich), as serviceable in febrile conditions generally, although excessive diaphoresis and cyanosis were sometimes produced. Bresler (Freiburg) reported its usefulness in influenza. Butler (Chicago) has furnished the most notable American report, which was generally favorable and gave it "high rank among analgesics and antipyretics."

LACTOPHENIN.

(Lactyl-p-phenetidin.)

$$C_6H_4\begin{cases} OC_2H_5 \\ NH.CO.CH(OH)CH_3. \end{cases}$$

A phenetidin derivative differing from phenacetin only in having a lactic acid in place of the acetic acid constituent. Occurs in fine crystals, colorless, odorless, nearly tasteless, and soluble in about 300 parts of water.

Antipyretic, analgesic and hypnotic, in doses of 0.5 gm. (7½ gr.) average for adults, best administered in powder form or in capsules. Lactophenin has been tested physiologically by several authorities (Schmiedeburg, Namirez, etc.), the reports agreeing that it reduces body temperature promptly, without untoward effect on respiration or circulation. Namirez says that it is but slightly toxic, a dose of 9.0 gm. (13.8 gr.) being required to endanger life of a man weighing 154 pounds. A few cases have been reported (Strauss, Koelbl) in which jaundice appeared after excessive doses of lactophenin; but these isolated reports in a six years' record of exceptionally favorable clinical tests, were promptly controverted, and it seems the general opinion of trustworthy

observers (Jaquet, Landowsky, v. Jaksch, Riedl, Liebreich, Christiani, Clevenger, Coulter, Patton, Potts, Thompson, Whittaker, etc.) that lactophenin is a safe therapeutic agent.

Besides serving as a safe, prompt and agreeable antipyretic, it has been reported on favorably in typhoid (v. Jaksch, Harison, Morrill, etc.), as an analgesic in rheumatic and neuralgic affections (Clevenger, Roth, etc.), and as a hypnotic (Jaquet, Thompson, etc.), and by Christiani as "quite safe and more generally useful—in insane subjects—than opium, chloral, trional or other hypnotic."

These reports have indicated that lactophenin is especially safe and useful for children, in doses of 0.48-0.13 gm. ($\frac{3}{4}$-2 gr.) for patients 1 to 12 years old.

LANOLIN.

(Adeps lanae.)

Under the name of adeps lanae wool fat was made officinal in the United States Pharmacopeia in 1890. It is also officinal in the British Pharmacopeia. In both it is the hydrous product which is recognized.

The United States Pharmacopeia recog-

nizes only the hydrous and declares that it should consist of not more than 30 per cent of water added to anhydrous lanolin or wool fat. This is accomplished by placing the lanolin in a warm mortar and gradually adding the distilled water with constant stirring. The chemistry of lanolin is so well known that it would be out of place to give any part of it here or to attempt a history of its medicinal application. Suffice it to say that wool fat has been used for centuries, but not until Prof. Liebreich devised a process for its purification was it used to any great extent, because of its unpleasant odor and irritating qualities. The principal reasons why it has become so popular as a base for all ointments are:

(1) Its stability or resistance to the agents which produce rancidity.

(2) Its property of taking up large quantities of water without losing its consistency.

(3) Its property of absorption by the skin, carrying with it all soluble salts, and such remedies as are given for their systemic effects.

(4) Its resistance to micro-organisms.

When used as a base for the application of potassium iodid or iodin these products are recoverable from the urine in a comparatively

short time, showing its quick absorption. It is indicated whenever it is desired to saturate the skin with fat, and when one wishes to carry into the system medicaments intended to produce systemic effects. Its quick and almost complete absorption makes it essential that the product should be as entirely free from the irritating fatty acids or decomposition products as possible, else they become a source of much mischief.

Not only is lanolin an ideal base for application through the skin, but the mucous membrane as well.

As a base or vehicle for the administering of remedies for syphilis, rheumatism, malaria; when it is desired to prevent the ill effects arising from disordered digestive functions, in skin diseases of whatever nature, as a base for all officinal ointments which are apt to be kept for some time and changes are sought to be avoided, lanolin will be found of inestimable service.

LYCETOL.

(Di-methyl-piperazin Tartrate.)

$(NH(CH_2CHCH_3)_2NH)+H_2T.$

Lycetol occurs as a white powder readily

soluble in water with a slightly acid, but pleasant taste. It melts at 243 degrees C.

This drug, which is the tartrate of dimethyl-piperazin, is more stable than piperazin, has an agreeable taste, and is said to be free from irritating effects upon the digestive organs, thus rendering it suitable for prolonged administration. It has been chiefly employed in the treatment of gouty cases. Aside from the solvent properties upon uric acid it also acts as a diuretic.

The dose is 1.0 gm. (15 gr.) dissolved in water.

LYSIDIN.

$(CH_2N)(CH_2NH)C.CH_3$

Lysidin is the ethylene-ethenyl-diamine hydrochlorate; is a hygroscopic crystalline substance having a pinkish color with a mousy odor. It is very freely soluble in water, and offered only as a 50 per cent solution.

In chronic gout or other afflictions dependent upon the presence of uric acid, its use has been freely and favorably commented upon by Grawitz, Mendelsohn and Goodbody, while in the treatment of rheumatism, renal and ves-

ical calculi, etc., it has proven quite successful.

The British Medical Association reports through Dr. Goodbody, 1896 British Medical Journal, that "Lysidin is a more powerful solvent for uric acid than is piperazin, and that it acts by rendering the blood more capable of removing the uric acid from the tissues by increasing its solvent power."

It is best administered in aerated water 2-4 c.cm. (30-60 min.) of the solution increased to 10. c.cm. (162 min.) dissolved in a pint or more of water to be taken daily.

LYSOL.

Lysol is produced by dissolving tar oil, in fat, and saponifying with alcohol.

A brown, oily fluid, having a creosote-like odor, and soluble readily in water in any proportion.

Antiseptic and disinfectant, five times stronger than carbolic acid, while only one-eighth as toxic (Cramer, Wehmer); used and recommended in gynecology and general surgery (Cramer, Haeule, Vondergoltz, A. H. Goelet), in skin diseases (Unna), especially in

lupus (Phillips), and in veterinary practice (Straube). Lysol in 1 per cent solution is very popular as a vaginal douche, being thus used at the Sloane Maternity Hospital (Amer. Ther., Nov., 1899). Casual favorable references have been numerous in medical literature of recent years, and lysol is undoubtedly in general use. Reports of lysol poisoning cases have appeared, but the facts usually showed that accidental swallowing of large quantities, 1 oz. or more, was the cause, and in most instances prompt treatment saved the victim. Properly used lysol is efficient and harmless.

MERCUROL.

With the idea "that possibly soluble compounds of mercury—with such substances as have a more intimate relation to animal tissue—might be comparatively non-irritating," i. e., possessed of bactericidal powers but relatively free from chemical action on the body-cells, Karl Schwickerath (N. Y. Med. Jour., Sept. 30, 1899), produced a nucleid of mercury to which he gave the name of mercurol. To an aqueous solution of pure yeast-nuclein

(called by Schwickerath nucleol) he added freshly precipitated mercuric oxide. The latter gradually entered into solution. On adding a large quantity of alcohol a voluminous white precipitate formed,—nucleid of mercury, mercurol, containing about 10 per cent of mercury. It is readily soluble in water, especially in warm water, with neutral or faintly alkaline reaction; insoluble in alcohol. Mercurol solutions are not stable, but can be made so by the addition of 0.6 per cent sodium chlorid. Albuminous substances are not precipitated by it, nor is it precipitated by alkalies, but it possesses strong germicidal properties.

Eugene Smith, of Detroit, ("Physician and Surgeon," April, 1899,) reports favorably on the use of solutions of this salt, applied once daily, in chronic conjunctivitis, blepharitis, phlyctenular and corneal ulcers, ophthalmia neonatorum, otitis media, etc.

The results of its use in gonorrheal ophthalmia have led to the hope that it may prove of great value in the treatment of gonorrheal urethritis.

W. A. Alger, in the Intern. Journ. of Surgery, March, 1900, reports twelve cases in

which he used mercurol solutions with prompt beneficial results. These cases included gonorrheal ophthalmia, trachoma, stricture of the lower canaliculus of the eye with extreme ectropion, acute conjunctivitis, external otitis and otitis media—which were treated with 2 per cent, occasionally 4 per cent, solutions. One case of gonorrheal urethritis was cured in a few weeks by 5 per cent injections of mercurol.

METHYLENE BLUE.

$C_{16}H_{18}N_3SCl$.

Medicinal methylene blue (hydrochlorate of tetramethyl-thionine free from zinc and arsenic), in the treatment of malaria, is not new. Recent reports, however, have added testimony to the fact that this drug stands next to quinin and, indeed, makes an excellent substitute for it in a great many cases. In a paper read before the Seaboard Medical Association and published in Merck's Archives, Vol. II, No. 2, J. W. P. Smithwick reported fifty unselected cases of various types of malaria treated by methylene blue. From his experiences he

draws the conclusions that: 1. Methylene blue is a perfect succedaneum for quinin and may be given whenever the latter is indicated. 2. Patients need not be selected on account of idiosyncrasies, as no bad effects ever follow the use of methylene blue, if given intelligently. 3. It is the remedy to use in malaria with hematuric complications. 4. It is the remedy to be given in malaria during pregnancy as it has no oxytocic effect and will cause a freer action of the kidneys. In the prevention of relapses he accords to methylene blue a greater value than is generally conceded it.

The modus operandi of methylene blue as a sedative in the excited states of insanity is not apparent. G. Lemoine, who used the drug in sciatica and other neuralgias, established the fact that the analgesic properties of the drug were not due to its chemical affinity for the axis-cylinders, but to methemaglobinization of the blood. Methylene blue has been found mildly analgesic to eczematous skin surfaces and 3 per cent aqueous solutions have been recommended for intertrigo, and for eczema of the ano-genital region. In gonor-

rhea, purulent ophthalmia, 3 gr. to 1 oz. water, also in foilicular tonsilitis same strength.

Dose internally 0.016-0.06 gm. (¼-1 gr.)

MIGRAININ.

Migrainin (phenazon-caffein citrate) is a white crystalline powder, readily soluble in water or alcohol, yielding a slightly acid solution, and is used in migrain or the headaches of influenza, neuralgia, sciatica, following alcoholic excesses, nicotin poisoning, etc. (Overlach). The addition of the cardiac stimulant caffein renders migrainin a more desirable remedy for frequent use than acetanilid, antipyrin or phenacetin.

The dose is, for an adult, 1.1 gm. (17 gr.) dissolved in water without the addition of other remedies. It should never be given in wine, beer or tea. A second dose may be taken, if necessary, in two hours. It is best administered on an empty stomach, and no food or drink should be taken for two or three hours after. More than three doses should not be given during the day.

NAFTALAN.

Naftalan is the name applied to a purified

naphtha, mixed with (1 part to 50) anhydrous soap, yielding a gelatinous salve-like mass.

Antiseptic, deodorant and antparasitic; recommended especially for treatment of burns, inflamed wounds, sores, contusions, sprains, rheumatic pains, skin affections of all kinds, etc.

The preparation has been widely used, and very favorably reported on in leading European medical journals; some doubt as to its origin has been lately expressed, and it has been officially designated a "nostrum." It has not been regularly introduced into this country, and consequently little used. The name is unfortunately similar to naphtalin, and, therefore. ill-chosen.

NARGOL.

A nucleid of silver, prepared by Karl Schwickerath, in the form of a brownish-white powder; readily soluble in warm water, with faintly alkaline reaction. It does not coagulate albumen and is not precipitated by alkalies or ordinary reagents for silver. (See Mercurol.)

THE NAUHEIM TREATMENT.

The names of Nauheim and Schott have within the past few years gained well deserved attention from the undoubted benefits derived in all sorts of cardiac insufficiencies at Bad Nauheim under Professor Schott's direction. Former theories as to the treatment of valvular diseases, as represented by digitalis, strophantus, etc., together with rest in bed, are so entirely upset by Schott's reasoning that a short resumé of his methods may be of interest.

Schott first employs baths containing 1 per cent of salt, which percentage is gradually increased, as each special case seems to require. Each immersion is of about five minutes' duration at a temperature of, to begin with, about 92 deg. F. The water of the Nauheim Springs is used, which is deprived of its carbonic dioxid by storage in tanks. To gain the desired temperature a certain amount of warm, distilled water is added, whereby besides the per cent of salt is controlled at will.

After each bath the patient lies down, entirely undressed, but between blankets, for an hour or more.

The per cent of salt is gradually increased

by the gradually decreased addition of hot water, whereby also the temperature is correspondingly lowered. When the natural strength and temperature of the Nauheim spring is reached some "mother lye," rich in calcium chlorid, as obtained from the salt works, is added. After a while the patient is promoted to the sprudel baths, which are rich both in salts and carbon dioxid, and finally to the running sprudel baths.

An interval of a day or more between every second, third or fourth bath is necessary, as patients are not able to stand more at a time. The effect of the baths is undoubtedly strengthening in the systole with prolongation of the diastole with consequent improvement in the quality and lowering in the rate of the pulse, while in bradycardia again, there is the desired increase in pulse.

When the tonic effects of the baths proves too irritating the baths are to be discontinued for more or less than a week, as the case may require.

In addition to the baths, slow, passive movements, or Wiederstand gymnastics, are given, whereby an increased flow of blood to the extremities and muscular structures is gained,

thus, though the dilated heart will have more work to perform, it is relieved of part of its load.

In this way both the general muscular system and the heart muscle itself grow stronger, and the general condition and tone of the patient improves.

The salts, the carbon dioxid and the temperature of the bath seem to act on the terminal nerve-filaments, probably as the fluoroscope shows us, by reflectly acting on the heart. There can be no doubt but all kinds of organic heart lesions are decidedly benefited by this treatment, though great care and careful observation is necessary when advanced cases of arterio-sclerosis or aneurisms are treated.

NIRVANIN.

(Hydrochlorate of diethyl-glycocoll-p-amido-o-oxybenzoic-methylester.)

It appears as a fine white powder or small crystal having somewhat the taste of potassium iodid; melts at 185° C., and gives a violet reaction with ferric chlorid; is very soluble in

hot and cold water, and in alcohol. Its aqueous solution is neutral, and it is claimed bactericidal in 1 per cent.

Nirvanin is anesthetic and analgesic in from ¼ to 5 per cent solutions, and reports indicate that it is less toxic in its effects than either cocain or eucain, in fact, physiological experiments have shown it to be ten times less toxic than cocain ("Luxenburger") and three times less than eucain ("Elsberg"). It is administered subcutaneously either alone dissolved in distilled water, or by the Schleich method substituting nirvanin for cocain, and produces anesthesia and analgesia as profound as does cocain, with the advantage of freedom from unpleasant by or after effects. There is no increase of pulse beat, number of respirations or apparent effect upon the mental condition of the patient. Those to whom it has been administered in dispensary practice in minor surgical operations have proceeded at once to their homes or usual avocations immediately after the operation.

In minor and major operations it has met the expectations of its sponsors, and thus far there has not been reported a single failure or bad effect. Being itself bactericidal it is not

necessary to either boil the solution or add to it chemicals to make it aseptic, boiling, however, does not destroy its anesthetic properties.

Care should be taken when injecting a solution of nirvanin, as well as other remedies, not to discharge the fluid into the tissues too rapidly, as this invariably causes pain. The maximum dose injected of nirvanin has been 0.51 gm. or 8 gr. When it is thought that general anesthetics, such as chloroform and ether, are contraindicated, and especially in older persons and children, and finally when heart, lung or kidney troubles are suspected, nirvanin will give a perfect local anesthesia without danger to the well being of the patient.

It has been used to secure anesthesia in operations for the radical cure of hernia, in the removal of carcinomatous mammary glands, in laparotomies, sciaticas, and various characters of growths such as fibromas, lipomas, atheromas, in abscesses, tonsilotomy amputations, operations on the phalanges, in hemorrhoids, excision of ingrowing nails, foreign substances in the eye, etc.

A limited anesthesia is secured when ap-

plied to unbroken mucous membranes, but not a sufficient degree to perform painless operations. Its anesthetic effect is best secured when brought into contact with the nerve terminals. Luxenburger of Munich reported 134 operations with absolute freedom from unpleasant effects. There was an absence of after-pain which so often follows the use of cocain. (Phila. Med. Monthly, July, 1899.) In solution it has relieved the pruritus of a long standing eczema, which had resisted all other measures. It has also proved of use in operations on the eye and on the bladder.

Nirvanin is used in dental surgery for extractions, devitalizing of nerve pulps, etc. It causes no excitement, does not affect respiration nor paralyze the heart's action. The patient can rise immediately after extraction. Anxiety, giddiness, vomiting or faintness, which so often occurs when cocain is used, is never observed. While nothing has appeared to indicate an increased anesthetic effect when used in connection with other remedies, I believe that experiment would show an increased effect if nirvanin were used in combination with antipyrin.

NOSOPHEN.

(Tetra-iodo-phenol-phthalein.)

$$(C_6H_2I_2.OH)_2C\begin{cases} C_6H_4CO. \\ O. \end{cases}$$

Nosophen contains 61.7 per cent iodin, Of the various iodin-compound substitutes for iodoform it has, perhaps, best stood the tests of practical experience. It continues in growing favor, and in the hands of many surgeons it has replaced iodoform entirely. Insoluble in water, and in alcohol, it is used as a dusting powder or in gauze-impregnations. Its sodium salt (antinosin), however, is water-soluble and has been used, therefore, not only in powder form but also in solution, usually of 2 per cent strength, for deep urethral and bladder irrigations, etc. The bismuth salt of nosophen (eudoxin-tetra-iodo-pheno-phthalein bismuth) is referred to elsewhere. Nosophen has been found, as a rule, to render the same service as a local antiseptic as iodoform. Being odorless and less toxic than the latter, it possesses advantages.

From a series of experiments on rabbits Edwin Klebs ("Studies on Internal Antisepsis," N. Y. Med. Jour., Feb. 17, 24, 1900)

draws conclusions, which he supports by observations on weight, temperature and blood appearances that, "Simply covering fresh wounds with a layer of nosophen is sufficient to destroy the air germs which may be deposited in the depths or in the scabs of partially closed wounds. It is also very probable that it destroys the cocci which enter the wound from the hands of the operator, because a nearly momentary admixture of two per cent antinosin with these organisms and with colon bacilli suffices to kill these bacteria," and, further, that nosophen and antinosin are of great importance in dealing with septic infections of streptococcic and staphylococcic origin. These drugs stimulate the prompt appearance of leucocytosis and eosinophilia. Antinosin, administered internally, he believes, to weaken the action of micro-organisms and to promote the vital functions without the danger that other iodin preparations possess in internal use. He uses 0.1 per cent antinosin solutions for the mouth and nares and, internally, administers 11.0-22.0 c.cm. (3-6 dr.) of the same solution.

NUCLEIN.

Nuclein therapy is closely related to serum therapy, and certainly deserves a place even in this short review.

Nuclein is a proteid, rich in phosporous, extracted from the white blood cells, the spleen, and other glands, and also from yeast cultures. Hahn and others have proven beyond doubt that a nuclein solution whether administered hypodermatically or orally causes increase leucocytosis and also that the blood serum from an animal, in which such hyperleucocytosis has been artificially produced, is considerably more bactericidal than the normal blood serum of the same animal.

As hyperleucocytosis with its attendant phagocytosis is the most potent means to protect the organism against the inroads of micro-organisms, when they once have passed into the circulation, as in septicemias and anthrax, and as besides the serum itself is proven increased in bactericidal properties, we have every reason to expect favorable results in such conditions. In tetanus, diphtheria, etc., where the bacteria remain localized, and cause their harmful effects by the toxins developed, we can hope for but little, and experience has

also taught, that hyperleucocytosis in these instances, as in malignant growths, is to be regarded unfavorably, or in other words as the last effort of the organism to fight against an enemy, that it cannot reach with its defending army. One of the chief defensive weapons of the organism, to cite Vaughn, who has given the subject a great deal of study, is a substance or substances originating in the white blood cells. This secretion or constituent of the leucocytes—to which the name of nuclein has been given—is considered to be at least one of the factors of natural immunity.

Clinical reports are frequently to be found in the medical press claiming very beneficial results in numerous diseases, such as incipient phthisis, pneumonia, pleurisy, puerperal and other septicemias, tonsillitis, typhoid fever, etc., from the nuclein solutions offered the profession by several firms, and we can certainly expect to hear more on the subject in the near future.

NUTROSE.

Nutrose is prepared from the casein of milk, which is combined with the alkali sodium, pro-

ducing a soluble powder which is colorless and tasteless. It is a complete substitute for meat albumin, easily digested and without irritating action upon the intestinal walls.

In convalescence from wasting disease, gastric or duodinal ulcer, diarrhea, etc., given in milk, broth or gruel it sustains the patient and increases the bodily weight. In the treatment of young children, especially when convalescent from scarlet fever, measles, diphtheria, pneumonia, etc., nutrose will be found an admirable reconstituent.

Neumann (Muench. Med. Woch.) himself took daily 33.9 gm. of nutrose making it represent about one-third of his daily amount of albuminous food. During this period the excretion of nitrogen exceeded ingestion by an average of 0.27 gm. per diem, and the nitrogen in the feces was not increased. In the three days following the nutrose period the nitrogen balance was +0.05 gm. The nutrose, therefore, appears to be absorbed and to be a fair substitute for native albumins. Finally it caused no digestive disturbance.

Bornstein (Berliner Klin. Wochenschrifft) also declares, after careful experiments, that nutrose participated in the proteid metabolism

with increase of weight. Nutrose is completely absorbed in the intestine and its administration, therefore, is indicated when after operations fecal motions should be avoided. It is readily and completely soluble in water, while its use seems to combat hypersecretion of hydrochloric acid in the stomach.

ORPHOL.

(Beta-napthol of bismuth.)

$[(C_{10}H_7O)_3Bi_2]+Bi_2O_3$ or

$(C_{10}H_7O)_3Bi+3\ H_2O.$

According to the first formula the compound contains 50 per cent of bismuth oxid; according to the second formula it contains 71.6 per cent of bismuth oxid and 23 per cent of beta-naphthol. It is a light brown powder, neutral, almost tasteless and odorless, nontoxic and non-caustic. In the intestine it splits up into naphthol and bismuth. It has been employed as an intestinal antiseptic in fermentative gastro-intestinal disturbances of infancy and adult life, in ptomain poisonings, typhoid fever, etc. It may be given to adults in total daily doses of 3.0 gm. (45 gr.), giving 0.6-1.0 gm. (10-15 gr.) at a dose, and in 0.1-0.3 gm. (2-5 gr.) doses every 3 or 4 hours to children.

It has received favorable notice (R. W. Wilcox, Louis Fischer, D. D. Stewart, Hugo Engel, and others) and is extensively used.

OREXIN.

(Phenyl-dihydro-chin-azolin hydrochlorat.)

$C_6H_4CH_2N.C_6H_5NCHHCl.$

A complex derivative of chinolin. It occurs as a white powder or crystals with a bitter pungent taste; is very slightly soluble in cold, but fully in hot, water, and is said to be free from toxic properties. Is used as a stomachic in phthisis, in wasting diseases, in uremic vomiting, and in organic disease of the stomach. It is said to increase the power of digestion also, but the reports do not accord it very phenomenal powers as a stomachic. It is contraindicated in excessive acidity and in anatomical changes in the stomach. The dose is from 0.26-0.5 gm. (4-7 gr.) in capsules two to three times a day.

ORTHOFORM.

(Meta-amido-para-oxybenzoic-methyl ester.)

$C_6H_3(OH)(NH_2)COOCH_3.$

A white voluminous, odorless and tasteless

with increase of weight. Nutrose is completely absorbed in the intestine and its administration, therefore, is indicated when after operations fecal motions should be avoided. It is readily and completely soluble in water, while its use seems to combat hypersecretion of hydrochloric acid in the stomach.

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According to the first formula the compound contains 50 per cent of bismuth oxid; according to the second formula it contains 71.6 per cent of bismuth oxid and 23 per cent of beta-naphthol. It is a light brown powder, neutral, almost tasteless and odorless, non-toxic and non-caustic. In the intestine it splits up into naphthol and bismuth. It has been employed as an intestinal antiseptic in fermentative gastro-intestinal disturbances of infancy and adult life, in ptomain poisonings, typhoid fever, etc. It may be given to adults in total daily doses of 3.0 gm. (45 gr.), giving 0.6-1.0 gm. (10-15 gr.) at a dose, and in 0.1-0.3 gm. (2-5 gr.) doses every 3 or 4 hours to children.

Orthoform has been successfully employed in burns of the second and third degree, varicose and other ulcers, hemorrhoids, carcinoma, tuberculous ulcerations of the throat, transplantations, dental caries, keratitis, conjunctivitis, corneal ulcers and after operations of all kinds where there is loss of tissue. It is antiseptic, preventing fermentation and putrefaction, but its antiseptic power is limited. It limits the amount and favorably influences the character of the secretions. It is often advisable to combine with it some of the antiseptics already mentioned, which will assist granulation or change the character of the lesion and depend upon orthoform for its pain quieting or anesthetic effect. Orthoform has been applied in various ways and for various purposes. As a diagnostic agent in determining gastric ulcer, as well as for the relief of the pains in gastritis; in an emulsion with yolk of egg, or by insufflation for dysphagia accompanying tubercular or specific laryngitis; in the nose after operations; as an ointment with lanolin to external lesions, and in conjunctivitis, etc.; in solution with alcohol or collodion after plastic operations; as a suppository after operation for hemorrhoids, curetment of

the uterus, urethritis, and as a bougie for the treatment of gonorrhea, suspended in water or a bland oil for painful cystitis or prostatitis. Finally in dentistry applied to cavities after extraction.

Regarding the disagreeable after effects from the use of orthoform, which have been reported, it seems that there is occasional intolerance. The trouble, however, is usually a too free use of the remedy in the majority of the cases, the physician leaving the application to the patient, and he seeking only relief from pain, uses the remedy too freely.

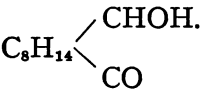
There have been five cases of eczema said to be due to orthoform in 330 cases treated (Luxenburger); gangrene not so frequent; even malnutrition of the tissues due to infection or hyperemia are reported as predisposing causes to necrosis of the tissues, so how much should be charged to the effects of orthoform, and how much to natural effects following the pathological condition is hard to determine. Whenever eczematous conditions accompany the use of orthoform it should be discontinued for several days, and if pain is severe tried again. If the same condition fol-

lows its use a second time, it should be abandoned.

Dunbar Roy (Therapeutic Progress, May, 1900) details several cases of otitis media treated with orthoform suspended in albolene. The mixture was warmed, shaken so as to thoroughly mix it, and the auditary canal half filled and the mixture allowed to remain, with the effect of entirely relieving the pain. M. A. Reasoner (Therapeutic Progress) gives the history of a case of cystitis with enlarged prostate treated with orthoform injected into the bladder suspended in water. One to four drams of a 1 per cent solution of orthoform was used once a day after washing out the bladder with hot boric acid solution. Bock used orthoform as a dusting powder after operation in the nose, mixed with other substances, and secured perfect healing without the formation of pus and without pain. While Daniel found that the use of orthoform allowed him to make endoscopic examinations of the urethra and cystoscopic examination of the bladder when the mucosa was highly sensitive without pain or the unpleasant complications which frequently attend the use of cocain.

OXYPHOR.

(Oxycamphor.)



Represented as a camphor derivation in which an equivalent of the camphor molecule is substituted by one of the hydroxyal groups. It is a white crystalline powder in the recent state with a slightly pepperish, bitter taste and smell. It should be free from the odor of camphor, and the aqueous solution should not show any globules upon its surface. It is neutral in reaction, and does not affect solutions of albumin. Physiological experiments show that the ameboid movements of the white blood corpuscles are retarded in a solution of oxyphor. It is freely soluble, especially so in hot water and alcohol. When exposed to light or moisture it easily decomposes, for which reason it is offered only in a 50 per cent alcoholic solution. This solution is called oxyphor.

Oxyphor is a perfect solution, acting primarily upon the respiratory organs. It is prompt in reducing the excitability of the respiratory centers. It also appears in its action to be directly opposite to the physiological ef-

fect of camphor, as camphor acts as an excitant especially of the functional centers of the medulla oblongata. Oxyphor does not produce irritation of the membrane of the brain or the centers of the medulla oblongata, but on the contrary it allays the excitability of the respiratory centers as above stated.

Oxyphor is especially applicable in circulatory dyspnea, insufficient heart action, organic and valvular lesions of the heart, and in aneurysms. There is a disappearance of objection dyspnea with a concurrent appearance of euphoria. The dose is from 0.5 gm. (7½ min.) to 1.0 gm. (15 min.) which may be increased to 2.0 (30 min.) to 3.0 gms. (45 min.) per day.

PARAFORM.

(Triformol.)

$(H.\ COH)_3$.

Polymerized formaldehyd; occurs as a white crystalline body, almost insoluble in water. An intestinal antiseptic in diarrhea, etc., said to be superior to salol, beta-naphtol, and to iodoform externally. Dose 0.5-1.0 gm. (7½-15 gr.), and has been given in doses of 5.0 gm.

(75 gr.) without ill effect. There is practically no literature, indicating lack of interest or insufficient intrinsic value.

PELLOTIN.

($C_{13}H_{19}NO_3$)

Pellotin is an alkaloid obtained from the Mexican cactus, Anhalonium, and is generally used as the hydrochlorid salt. The salt occurs in colorless, prism like crystals, and is readily soluble even in cold water. It was isolated and introduced by A. Hefter in 1896, who reported fully on its physiological properties, assigning it a place as a narcotic of equal rank with morphin.

Prof. Jolly, of the Chaite in Berlin, was the first to report clinical trials, which were favorable; the dose employed averaged 0.002 gm. (1/25 gr.). The first American report was published by R. H. Hutchins (1897), who tested the drug in four cases at the St. Lawrence (N. Y.) State Hosp., observing that "the sleep produced is particularly calm and natural," no side or after-effects being observed,

and patients awakening refreshed. R. W. Wilcox, in October, 1897, before the New York Post-Graduate Clinical Society, stated that the drug had a limited record, but was useful and afforded several advantages; in his summary he placed it third in rank as to potency, first for prompt effect, and second for safety.

There have been no additional reports of consequence, and the drug is only in very limited demand. The plant, by the way, contains very little of the alkaloid, often none, and hence it is difficult and expensive to obtain. This is probably the principal reason for the lack of interest in it.

PERONIN.

(A hydrochlorid of benzyl ester of morphin.)

$C_6.H_5.CH_2.O(OH)C_{17}H_{17}NO.HCl.$

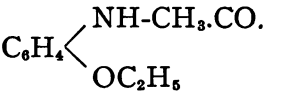
Peronin is produced in the laboratory by replacing the hydrogen of the hydroxyl group in morphin with the alcohol radical ($C_6H_5CH_2$). It occurs as a white powder, odorless and a bitter taste. It is only slightly soluble in cold water, but soluble in 10 parts of boiling water. It is also soluble in alcohol and chloroform. Therapeutically peronin oc-

cupies an intermediate point between morphin and codein. In over-doses it produces convulsions and death. It is a feeble narcotic without effect upon the circulation or the gastro-intestinal tract. Its use has been limited to quieting the cough of phthisis, chronic bronchitis, etc. Its analgesic and hypnotic powers are limited.

Dose, 0.02-0.06 gm. (1/3-1 gr.), given three or four times during the day.

PHENACETIN.

(Para-acet-phenetidin.)



Phenacetin occurs in colorless, inodorous, tasteless crystalline scales, which melt at 135° C. (275° F.) It is sparingly soluble in water, but soluble in sixteen parts of alcohol.

This drug is still employed as an antipyretic and analgesic, the general tendency being to give it in smaller doses than formerly. W. A. Briggs, of Sacramento, however, who has employed phenacetin in the treatment of enteric fever since 1888 in over one hundred cases,

recommends the systematic use of the drug in good sized doses every two to four hours, supplemented at first by cold bathing, and later by Leiter's coils and ice baths. During epidemics of influenza, phenacetin has been employed in combination with caffein, salol, quinin and salophen.

Since the annexation of the Sandwich Islands a disease known as "Boo-hoo" fever has prevailed more or less among the American troops, which somewhat resembles grippe, being attended with severe pains in all the bones, pains in the back, severe headache, slight fever, and much mental depression. In this class of cases quinin and phenacetin were found of value. In yellow fever phenacetin has also been used for the reduction of the temperature and the alleviation of the pains.

PHENOCOLL HYDROCHLORID.

(Glycocoll-p-phenetidin hydrochlorid.)

($C_6H_4(OC_2H_5)NH$, $COCH_2NH_2HCl$.)

Phenocoll hydrochlorid is a product closely resembling phenacetin, but readily soluble in water; a white powder, tasteless and odorless.

(The salicylate phenocoll is called salcocoll, recommended as anti-neuralgic, but not much used.)

Antipyretic and anti-rheumatic, with a special record of usefulness in treating malaria (as a quinin substitute); dose 0.5-1.0 gm. (7½-15 gr.), in solutions, powders or pills. This is one of the few products with a record of exhaustive physiological tests in an American institution (University of Pennsylvania), the result of which (by comparisons made at same time with antipyrin and phenacetin) were very favorable. The urine of those taking this drug assumes a dark reddish-brown color, but does not contain albumin.

PICRIC ACID.

(Trinitro-phenal.)

($C_6H_2(NO_2)_3OH$.)

Picric acid is obtained by the action of strong sulphuric acid upon carbolic acid, and afterwards treating with nitric acid or sodium nitrate. It is soluble in water, making a yellowish colored solution with a very bitter taste. Therapeutically picric acid has been used lo-

cally for burns, and in the various forms of eczema.

Macdonald sums up the advantages of picric acid in burns (1) ease of application, (2) painlessness, (3) rapid repair, (4) absence of irritation, (5) more natural cicatrix.

It is used in from 8 per cent to saturation in either ether or alcohol.

PIPERAZIN.

(Diethylen-diamin.)

$NH\text{-}(CH_2)_4\text{-}NH.$

A product of the action of ammonia on ethylene bromid or chlorid. Occurs in colorless, acicular crystals, is tasteless, deliquesces readily, and is easily soluble in water.

It is a uric acid solvent, combining (it is said) with 12 times as much uric acid as will carbonate of lithium, while the resultant urate is 7 times more soluble than the similar lithium urate. The clinical record of its usefulness in the treatment of gout, arthritis, gravel, and diseases due to uric acid diathesis, is extensive and favorable, from the earlier reports of Biesenthal, Schmidt, Ebstein, Sprague,

Schweninger, etc., to the more recent records of Wilcox, Eshner, Hamilton, etc.

Dose, 1.0 gm. (15 gr.) daily, preferably dissolved in a quart of carbonated water, and taken in wineglassful doses at intervals during the day.

Aside from its internal administration in gout it has been recommended to inject a solution into gouty tophi (about 1 grain in 8 drops of water). Giofredi, the originator of this method, has observed the disappearance of the gouty concretions in the tendon sheath of the peroneus longus, and he thinks that antiseptic injections of weak solutions of piperazin may be of value in gouty troubles of the joints. Several cases of renal calculus have also been published in which piperazin obviated the necessity of operative measures. In rheumatoid arthritis promising results have been reported.

PROTARGOL.

Protargol is a silver albumose said to contain 8 per cent of metallic silver. It is a yellowish colored powder freely soluble in water. The solution is not affected by heat, albumin,

hydrochloric acid, a weak solution of sodium chlorid or a solution of caustic soda.

Solutions of protargol should be kept in amber colored bottles.

Protargol has during the past year been made the subject of numerous reports. The general opinion indicates that it is a valuable acquisition to the treatment of gonorrhea. In this disease its action is to destroy the gonococcus both on the surface and in the deeper layers of the mucous membrane; after this has been accomplished the remaining discharge should be arrested by astringent injections.

The subject of the prophylaxis of gonorrhea has attracted unsual interest during the past year. In place of the nitrate of silver solutions which were recommended by Blokuseski and others, E. R. W. Frank, and Joseph Welander advise the instillation of a few drops of a 20 per cent protargol solution, into the meatus as a preventive against gonorrhea. The most elaborate article that has appeared on this subject is by F. Bierhoff (Philadelphia Medical Journal, July, 1899), who cites the experiments of Frank which proved that a solution of protargol of the above strength killed the gonococcus in five seconds. In his opinion,

this procedure offers a safeguard against gonorrheal infection when intelligently carried out. This solution produces little or no irritation, and is to be applied directly after coitus.

In chronic urethritis protargol has proved less efficient than in the acute or subacute form; here the nitrate of silver installations, according to the methods of Guyon and Ulzmann, are still preferred by some authors. In cystitis, irrigation with protargol solutions have proven of value. Several favorable reports have lately appeared on the use of protargol in the treatment of diseases of the female genito-urinary organs, such as vaginitis, urethritis, metritis, and endometritis. A. Ravogli (Medical News, November 18, 1899) in discussing the treatment of gonorrhea in the female, advises the use of protargol in one to three per cent solutions as a urethral injection in cases of urethritis, as an injection into the ducts of the Bartholinian glands, when affected, and especially in endocervicitis and endometritis. The latest report on this subject is by A. Caileux (Inaugural Dissertation, 1900) who has made a very extensive study of protargol in cases of metritis. He employed

the drug in the form of intra-uterine applications of a 10 per cent solution on a cotton-wrapped probe, and also in the form of bougies.

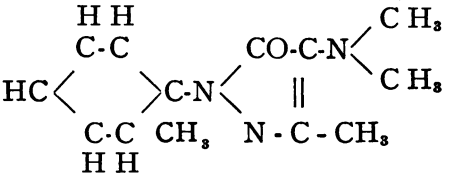
Voluminous literature has appeared on the use of protargol in 2 to 10 per cent solutions in various affections of the eye, especially ophthalmia neonatorum, acute and chronic conjunctivitis, dacryocystitis and trachoma. Its penetrating power and strong germicidal action are well illustrated in cases of gonorrheal conjunctivitis. In a recent epidemic of trachoma in Berlin described by Schultz (Albany Medical Annals, March, 1900) it proved a valuable auxiliary after the removal of the trachoma granules.

Several authors have reported their experience with protargol in diseases of the nose and throat, having employed it in the form of solutions varying in strength from 2 to 20 per cent. Applications of a solution to the nasal mucous membrane in cases of hay fever have afforded good results. In the treatment of suppuration of the antrum, injections of protargol were found by C. H. Nicholson to rapidly arrest the discharge. In chronic suppuration of the middle ear E. B. Gleason

(Laryngoscope, March, 1900) reports noteworthy results from injections of a small quantity of a 5 per cent solution of protargol into the attic by means of Blake's cannula. It is of interest to note that protargol has been employed internally by J. Ruhemann (Deutsche Med. Wochenschrift, October 5, 1899) in gastric ulcer, chronic diarrhea, and intestinal hemorrhages, as well as in septicemia of gonorrheal origin, and also in locomotor ataxia. The drug was administered in pill form in daily doses of about 0.6 gm. (10 gr.). As an application to wounds, ulcers, and chronic diseases of the skin protargol has been recommended by Valencon (Medical Bulletin, May, 1899) and by Floret (Deutsche Med. Wochenschrift, October 5, 1899). The class of cases in which it is particularly indicated is chronic ulcers in which a stimulating antiseptic is required. It has also been employed as a dressing for infected wounds and abscesses after incisions, burns, and chronic cutaneous affections. It may be employed here both as a dressing powder and in ointments or solution, the stronger applications being made in the more chronic cases where a stimulant as well as an antiseptic is desired.

PYRAMIDON.

(Di-methyl-amido-phenyl-dimethyl pyrazolon)



Pyramidon is a derivative of antipyrin in which an H-atom of the pyrazolon group is replaced by a dimethyl-amido group. It is a yellowish white crystalline powder, soluble in ten parts of water and nearly tasteless.

The action of pyramidon upon the nervous system is similar to that of antipyrin, but in much smaller doses. It is milder, more gradual, and more lasting in its effects. Filehne (Berliner Klin. Wochenschrift) reports favorably upon the use of this antipyretic and analgesic in pains of all kinds. Lepine (Lyon Medical) states that he never observed injurious effects from the use of this remedy, although given in a case of tabes up to 3.0 gm. (45 gr.) daily. In chorea, abdominal typhus, neurasthenia, etc., the remedy was found useful. The most noteworthy effect was observed in the treatment of pulmonary tuberculosis. Horneffer administered it in 24 cases in all

236 times, in doses ranging from 0.2-0.6 gm. (3-10 gr.). The reduction of temperature was gradual, and reached its maximum in two to three hours, from 0.5 to 2.5° C. In facial erysipelas, pneumonia, scarlet fever, and as an antineuralgic its actions were favorable without untoward effects.

The dose is for consumptives suffering from hectic not to exceed 0.5 gm. (7½ gr.). In other instances 0.5-0.8 gm. (8-12 gr.) may be given, although 0.2-0.3 gm. (3-5 gr.) have proven usually sufficient.

ROENTGEN RAYS.

Roentgen rays are constantly proving of more and more service as diagnostic aids, not only to surgery, but also in medicine. Skiagraphy as a diagnostic factor in cases of fracture and dislocation is too well known to need further mention. Its value in military surgery was well proven in our late war, especially in the hands of Dr. Gray on the Hospital Ship "Relief," and reports to the same extent are now reaching us from the South African field of war. Orthopedic surgeons generally consider the X-rays indispensable, and the gen-

eral surgeon has by this means succeeded in arriving at a positive diagnosis in nephro-lithiasis, foreign bodies, etc., when formerly only exploratory procedures could bring light on the question.

The advances in skiagraphy during the past year or so, as diagnostic agents in pulmonary and cardiac disease are noteworthy. Williams of Boston and Stubbert of the Loomis Sanitarium have amongst others published splendid papers on the results obtained by them, especially in fluoroscopic examinations of the thoracic viscera, which are well worth perusing by students in this line. Not only consolidations, pneumonia, cavities, and miliary tuberculosis are definitely made out in this way, but also pleurisy, asthma, pneumo-thorax, thoracic aneurisms, new growths, hydrothorax, the size and movements of the heart, as well as the mobility of the diaphragm where usual diagnostic signs are often insufficient.

In the normal chest, where the right apex is not quite as clear as the left, especially during expiration, both apices, the ribs, the heart, and part of the aorta, as well as the movements of the diaphragm are distinctly visible, especially in persons without excessive adiposity,

in which case all these parts are less distinct.

In infiltration, a haze is apparent, and the clavicle may appear as if covered by a veil, or with more pronounced infiltration, even the ribs may become more indistinct, when the haze gradually fades away to the normal.

In consolidation, again the clavicle and some ribs may even become invisible; the consolidated area is sharply defined and usually surrounded by the haziness characteristic of infiltration. When both apices are involved, the comparative shadows are very instructive to study. Foci of disease are discovered even before their presence can be made out by auscultation and percussion.

Softening and cavities show as spots of light, surrounded by the dark area of consolidation.

The effusion of pleurisy shows as a perfectly black shadow, and if the patient is shaken up, it is very interesting to observe the splashing of the fluid, as if a bottle half filled with water be agitated. The displacement of the heart consequent to effusion can also easily be made out.

In asthma and emphysema the lungs seem brighter than normal, their volume larger, the

intercostal spaces wider and the diaphragmatic excursions less marked.

As the size of the heart is more important than murmurs in the prognosis of cardiac disease, and as the fluoroscope is our best and only positive gauge in this respect, it is easily seen how important is skiagraphy in this line.

Heart reflex. The X-rays have revealed quite a curious phenomenon, which deserves mention. Whenever the cutaneous surface of the precordial area is irritated as by rubbing or ether spray, the myocardium is seen to contract reflexly. This contraction is more vigorous the better the condition of the heart-muscle. It has been suggested that this may to some extent account for the beneficial effects of the Schott and Nauheim treatment of various cardiac lesions. As the subject of skiagraphy is too extensive for this paper, the student is referred to the extensive bibliography on the subject for detailed information.

SALACETOL.

Salicyl-acetol.

C_6H_4 (OH) $CO.OCH_2CO.CH_3$.

A compound of salicylic acid 71 per cent

with aceton alcohol, and analogous to salol. Occurs in white, glistening scales, only slightly soluble in cold or hot water, but readily in 25 to 30 parts castor oil or almond or olive oils.

Salacetol was introduced as a non-toxic substitute for salol, and was recommended, especially for children, as an intestinal antiseptic (in summer or choleraic diarrhea); dose 2.0-3.0 gm. (30-45 gr.) in 30 c.cm. (1 oz.) castor oil, to be taken before breakfast.

It may be employed in all cases where salol is indicated, and is much safer. Recommended in clinical reports by Bourget, Barbay (in acute rheumatism), Benedict, Armbruster, and others.

Caution:—Salacetol should not be mistaken for the subsequently introduced mixture called salaktol, made up of hydrogen peroxide, sodium salicylate and sodium lactate, a reputed remedy for diphtheria, now almost obsolete.

SALIPYRIN.

(Antipyrin salicylate.)

($C_{11}H_{12}N_2O.C_7H_6O_3$.)

A compound of 57.7 parts of antipyrin and 42.3 parts of salicylic acid. Occurs as a white,

crystalline powder, odorless, only sparingly soluble in water. Used extensively in Germany, and less so here, in the treatment of neuralgia, migrain , rheumatism and influenza —for which latter condition it is claimed by some to be a specific. It is said to be free from the depressing action of antipyrin, but to exhibit the effects, in other respects, of both antipyrin and salicylic acid.

Von Mosengeil praises salipyrin highly. He recommends, in influenza, that the employment of the drug should be begun early and continued after the subsidence of the symptoms; that when a single daily dose is to be given it is best to administer it at bedtime; that food should not be eaten for 1½ to 2 hours before or after the administration of salipyrin; that large doses should be given in cases with high fever. Lochlein and Martin praise its beneficial effect if given early to diminish excessive menstruation and dysmenorrhea.

At the international gynecological congress at Amsterdam Oscar Beuttner referred to the experiences of Bigelow, Orthmann and others, with antipyrin in hemorrhagic conditions of the uterus. He deduced from his own experiences that salipyrin is indicated in menorr-

hagia, metrorrhagia (not dependent on carcinoma, larger tumors, labor or abortion), endometritis (hemorrhag.) post-abortum, climacteric hemorrhages, threatened abortion, dysmenorrhea, uterine disturbances with neuralgic and periodical symptoms, premenstrual and menstrual conditions of psychical depression.

Dose, 1.0 gm. (15 gr.), repeated not oftener than 4 to 6 times daily, to be given in capsules, cachets, or in some aromatic tincture with flavoring syrup.

SALOPHEN.

(Acetyl-para-amido-phenyl salicylate.)

$$(C_6H_4\begin{cases}(O\ H.\\(COOCH_6H_4\ NH\ (C_2H_3O)\end{cases}$$

Salophen is described as a salol compound in which the carbolic acid element is replaced by the acetylamidophenol group. It contains 50.9 per cent of salicylic acid, occurs in white crystalline flakes, which are almost insoluble in water, freely so in alkalies, alcohol and ether. It melts at 187° C.

While this preparation was formerly em-

ployed chiefly in the treatment of rheumatic affections its scope of usefulness has gradually enlarged, and it is now employed as a general analgesic, more especially in the treatment of neuralgic affections and for the relief of the pains in influenza. According to recent writers salophen combines the effects of phenacetin and salicylic acid, and this would explain its antipyretic and pain-relieving qualities. The fact that salophen is reported a perfectly safe remedy renders it of particular value in diseases of children. Phillips (British Medical Journal, October 8, 1898) considers it as one of the best of the recently advanced synthetics. R. C. Kenner (Medical Mirror, May, 1898) reports 75 cases of acute articular rheumatism treated with salophen, of which 30 cases recovered in 4 days, 20 in 7 days, and 15 in 16 days, the remaining 10 persisting from 22 days to several weeks. The most complete study that has appeared on salophen during the past year is by E. C. Hill (Denver Medical Times, November, 1899). He states that a careful and impartial summary of all the clinical evidence proves that up to the present time this remedy is our best, safest, and most eligible anti-rheumatic, and that it is also an efficient

antineuralgic and intestinal antiseptic. His own observations cover several hundred cases, and are confirmatory of his first report published over five years ago.

Dose, 0.5-2.0 gm. (7½-30 gr.)

SANOSE.

Sanose is one of the many new albumin preparations; contains four-fifths casein and one-fifth albumin; occurs as a white powder; is odorless, tasteless and forms an emulsion with water, which resembles milk.

A tonic and dietetic, first recommended by Schreiber and Waldvogel (Goettingen), who gave it in bread (containing 10 per cent. sanose) and recommended it for patients who dislike, or should not indulge largely in a meat diet. They observed that it did not cause a diarrhea, an effect usual from other like products. Biesenthal (Berlin) reported remarkable success in feeding infants and invalids with sanose, and ranks it superior to somatose.

From France similar products have been introduced under the names of carnose and nutrimentose, soson, tropon, caseon and

plasmon are closely allied products; there seem to be enough albumen compounds available now to supersede all kinds of ordinary food—but they evidently make little progress in actual use.

SERUM-THERAPY.

As in many other lines of science, we have chiefly to thank the Germans for the present status of our knowledge of bacteriology, and incidentally the antitoxins, even though the French veterinarian Davaine was the first to direct the attention of the world to the existence of bacteria. Davaine's discovery of the anthrax-bacillus led to Pasteur's investigations of fermentation and later of chicken-cholera, and with these researches as a foundation Koch and his associates, Briezer, Ehrlich, Behring, Ulzserman and others have at the Institute for Infectious diseases at Berlin, built up practically the whole field, not only of bacteriology as it stands to-day, but also of serumtherapy.

Koch's classical work on tuberculosis, published in 1882, remains practically unchallenged.

Brieger's original research on ptomains and

the toxic products of bacterial growth has gained but few addenda.

Pfeiffer's investigations of the influenza-bacillus are equally valuable, while Ehrlich and Behring have perhaps contributed most extensively to the formulation of blood-serum-therapy in general and diphtheria and other anti-toxins in special.

In the consideration of serum-therapy it will, even in this short review, be necessary to lightly touch upon bacteriology, the influence of predisposition and immunity to disease, the chemical toxic products of microbic life and their influence on the living organism.

Davaine first demonstrated that the blood of an animal suffering from anthrax, when injected into another animal, reproduced the disease, while the same blood, carefully filtered so that all anthrax bacilli were eliminated, became inocuous. Pasteur later found that when the bacilli of anthrax or chicken-cholera were cultivated in bouillon at a relatively high temperature, they lost part of their virulence. He found, further, that animals inoculated with these "attenuated" cultures, gradually became immune to the most virulent form of the corresponding disease. This

procedure has gained wide practical application in protecting animals against anthrax and chicken-cholera in infected localities.

It was at first supposed that the various bacteria, related to the infectious diseases, were the cause, not only of the disease, but also of the symptoms coincident with the disease. More accurate observations, however, have proven that the manifestations of the various infectious diseases are in most instances caused by the chemical poisons or serum-culture toxins produced by the micro-organisms in their growth. Diphtheria gives us a very rational example of this. We have here a disease where the micro-organism rarely extends beyond the superficial tissues of a limited area of the throat, only at times penetrating the mucous membrane to the sub-mucous tissues. Death in diphtheria is usually caused by nerve-degeneration—be it of the cardiac ganglia, the vagus, or the nerve centers. These degenerations could not possibly be caused by the micro-organisms themselves, as they are not to be found except at the seat of the local lesion, but they are caused by the toxins generated by the micro-organism in its life-growth and taken into the circulation.

Briezer succeeded first in isolating some of these toxins, or tox-albumins, in almost the pure state.

Further experiments proved that animals gradually inoculated with the toxins obtained from cultures, were rendered more or less immune to the specific disease, such as, for instance, diphtheria, tetanus, septicemia, cholera, glanders, etc.

As to the question of how immunity is produced and what is the nature of this immunity, many theories are advanced. One claims that it is due to the direct bactericidal action of the fluid. Another (Nutchnikoff) theory is that resistance is gained through the phagocytic action of especially the poly-nuclear leucocytes, whereby the causative micro-organisms (as can actually be observed on the warm stage under the microscope) are absorbed or digested.

The probability is that immunity is the complex sum of various factors, as the germicidal action of the blood serum and tissue-fluids, the phygocytic action of the leucocytes, the antitoxic action of the alexins, etc.

It seems that the tissue-cells or the leucocytes, or both, when micro-organic infection

tours. form certain new substances designated as alexins, which have the peculiar power of neutralizing the toxin produced by the micro-organism. These alexins or antitoxins are in fact produced, whether the attenuated cultures or their toxins are injected, and gradual immunity to even virulent and enormous doses is produced. The blood-serum of animals thus gradually immunized, if used for the inoculation of healthy animals, will render them insusceptible to the poison, or in other words, act as an antitoxin. This immunity against infection is, however, more or less transient, and is, as we know, both clinically and bacteriologically considerably influenced by various factors, such as cold and exposure, inanition, etc., which depress the vitality and predispose to infection and disease.

In the practical production of the various antitoxins, an animal, as a goat, cow or horse, for instance, is gradually rendered immune to the specific micro-organism by the injection of either attenuated cultures rendered comparatively harmless by heat and cultivation at relatively high temperature, or very minute quantities of the virulent organism itself. The

specific toxin—the chemical product of microbic life—obtained either by the sterilization of the bouillon culture of the organism by heat (about 58° C.), the addition of ½ per cent carbolic acid, or else by filtration through a porcelain filter, is now, however, mostly employed. After the animal has received gradually increasing injections of the toxin, it is found to be immune to infection from the organism in question. Part of its blood is now withdrawn under strict aseptic precautions and the blood-serum constitutes the antitoxin.

Diphtheria.—The conclusions regarding the average reduction in mortality from diphtheria after the antitoxin treatment by not less than 50 per cent, and under more favorable conditions a reduction to one-fourth or even much less of the previous death rate, are drawn from about 100,000 cases, collected from many different countries and in so many different years, that none but the most ignorant dares to oppose it, and no doubt can exist to any one with average intelligence as to its reliability if employed early enough. (Biggs, Park, etc.) It has been found that 200 to 300 units of diphtheria antitoxin will provide immunity against diphtheria for from

two to four weeks, and these immunizing doses have practically entirely stamped out the disease from the large infant asylums, where it formerly was so mortal. (Park, Northrup, etc.)

The dose of diphtheria antitoxin as a curative agent should be from 1,000 to 3,000 units, according to the severity of the disease and the age of the patient. This dose is to be repeated in 12 to 18 hours if no improvement is noted and the case remains severe. (Park.)

Tetanus.—As the bacilli of tetanus remain at the seat of the infection and increase but slightly in numbers, the disease itself is a true toxemia and not a septicemia. Its antitoxin ought consequently to be quite ideal, and such has repeatedly and everywhere proven the case when it is employed as a prophylactic or immunizing agent before any tetanic symptoms have appeared. In fact, the power of the tetanic serum to neutralize the poison before it has affected the cells is marvelous (Lambert). After the injury to the cells it is, however, unsatisfactory, uncertain and but slightly active. Good results have, however, been gained in many cases and an active, fresh antitoxin should certainly always be tried.

Pneumonia.—The sudden fall in temperature and consequent amelioration of all the symptoms at the time of crisis in this disease has by many been considered as due to the development of an antitoxin in the blood. This seems, however, very doubtful, and many other factors bearing on the time of crisis may be pointed out, as for example, that the majority of pneumococci in cultures die in about 5 to 7 days. An increase of acidity in the lung may also be sufficient to prohibit the growth of the pneumococci, or the development of their toxin.

The exudate of pneumonia, though within the lung, is practically outside the body, as far as the tissues themselves are concerned. It is in this exudate that the pneumococci flourish and from this the surrounding blood vessels absorb the toxic products.

Lambert of New York, who with Eyre and Washburn in England, and Pane in Italy, have worked most faithfully on this subject, and have come to the conclusion that even though the pneumonia serum seems to prevent general pneumococcus septicemia, still it does not shorten the duration of the disease, nor bring about crises.

Streptococcus infections.—Not only septicemia, but also erysipelas, tonsilitis and cellulitis, etc., are caused by streptococci of greatly varying virulence. Many other diseases, as broncho-pneumonia and arthritis are caused by them alone, or associated with other germs. Besides these many of the worst symptoms of phthisis, certain cases of diphtheria, etc., are the result of streptococcus infection. We have therefore a wide field for experimentation in this line. It seems, however, that in none of these various streptococcus infections is there any striking tendency towards the production of immunizing or curative substances in the blood. The value of an antistreptococcus serum is also very hard to estimate and the results have so far in most instances been unsatisfactory and unsuccessful. Marmorek claims to have had positively curative effects in a number of cases of various kinds, and many reports of failures as well as some successes have appeared in the medical press. As the repeated injection of this serum certainly is lacking in danger, and as many cases of puerperal fever and septicemia undoubtedly seem to have been benefited by the employment of a freshly drawn and properly tested

serum, it seems our duty to await further trials and experiments by careful observers before attempting to pass judgment on the subject.

The treatment of sarcoma, with the toxins of erysipelas and prodigiosus as first recommended by Fehleisen and largely carried out in this country under the directions of Coley, has in most instances met with failure, or but temporary benefit. As, however, the treatment is especially recommended in inoperative and progressive cases, and as in some such cases undoubted arrest or disappearance of the growth has occurred, the treatment should certainly deserve further trial.

Tuberculosis.—In the treatment of this disease not less than three different preparations have been used. Koch first claimed curative effect from what now is called old tuberculin, which is the partially evaporated culture medium of old tubercle cultures. The new tuberculin or "T. R." as it is also called, is the watery extract prepared from the triturated, virulent tubercle bacilli, without any culture medium.

Besides these two tuberculins, a serum, obtained from animals, which have received numerous gradually increasing doses of either

of the above named tuberculins, or the attenuated tubercle bacilla themselves, has also had extensive trials.

The conclusions of de Schweinitz, who has given a great deal of study to the subject, seem to best represent the present status of "old" tuberculin: "It apparently has a decided curative action for lupus. It is a valuable, diagnostic agent both in animals and man and should be used very much more extensively than heretofore in diagnosing incipient phthisis."

In regard to the new tuberculin no uniform and satisfactory results have so far been attained, but we may refer to Park's opinion regarding it: "From Koch's reputation we certainly have reason to believe his statements, and may hope in the new tuberculin to have a real help in hastening the recovery of the more favorable cases." The serum treatment seems also unsatisfactory. To quote de Schweinitz: "Only after several years of treatment has the serum from these animals shown some apparent neutralizing and curative properties." We shall certainly have to wait until further researches have been made before passing judgment upon the subject.

Yellow Fever.—The serum prepared by Sanarelli from the bacillus icteroides, as well as the prophylactic fluid, prepared according to Haffkine's method, from the bacilli icteroides and colon, found at autopsies in the liver, heart and blood of yellow fever patients, both seem unsatisfactory. Fitzpatrick, who with Daly of New York has experimented considerably on the subject, summarizes the experience thus far obtained: "The serumtherapy of yellow fever is still in the stage of investigation, and does not appear to warrant any conclusions other than that the blood-serum of the bacillus icteroides does not cure nor modify the disease, and that further investigation is necessary."

Plague.—Ever since the discovery of the plague bacillus great numbers of experiments have been made, especially by Roux and Yersin, to obtain an immunizing and curative serum. Very good results in this line have also been obtained by a number of investigators and hopes can be entertained for future success.

Typhoid Fever, Cholera and Hydrophobia are some of the diseases that have also been treated with various kinds of serum and, it

may be added, with varying success. Much more thorough investigations will, however, have to be made, before any decided views on the subject can be formulated for or against the employment of such serums.

SILVER.

While Credé's soluble silver salts possess decided therapeutic value, and in many cases certain advantages, they have not extensively replaced the older antiseptics. Actol (lactate of silver) is irritating when applied in solid form, and its solution like that of itrol (citrate of silver) should be used only when freshly made.

Paul Meyer, in reporting his experience with Credé's silver preparations, summarizes as follows the value of the soluble salts in wound treatment:

"The course of wounds under the silver treatment is in general similar to that under the usual aseptic and antiseptic procedures. But it possesses two important advantages. Rapid and reliable healing can be obtained without asepticism and with less rigorous anti-

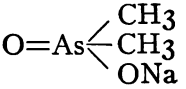
septic measures, and thus with simpler means and less trouble.

"The second advantage is the marked tendency of the method to effect the localization of inflammatory processes, as Credé claims. In most cases the inflammation of the tissues surrounding the lesion subsided in the shortest time, and even when it progressed along the lymphatics a general infection was prevented.

"In the treatment of gonorrhea, urethral and conjunctival, these silver salts and colloidal silver have had many trials, with the deduction that they at least equal the nitrate of silver, and are certainly less irritating."

While considerable literature has appeared concerning the use of collargolum (soluble metallic silver) chiefly in the form of Unguentum Credé, in septic conditions, it has dealt, for the most part, with isolated cases. Colloidal silver cannot, as yet, be regarded as a specific in the treatment of septicemia. It often fails where one might most expect it to succeed. Nevertheless it has frequently proved of unmistakable value in various grades of sepsis, and in a now fairly large number of cases it has apparently been successfully used.

SODIUM CACODYLATE.



Sodium cacodylate is a white crystalline salt, tasteless and odorless organic compound of arsenic, soluble in water. It has a three-fold action,—revivication of the red blood cells, increase in number of the leucocytes, and increased activity through the cells of resisting bacteria infection and their toxines. It is indicated in all affections where arsenical preparations are useful, and especially so in anemia, chorea, malaria tuberculosis, diabetes, chlorosis, skin diseases, etc.

This preparation has been used by Garand and Belbeze in the chorea of Sydenham in three cases with cure. It was administered by injection of a solution in water 1:400. Five c.cm. (1 drachm) was used daily for five days; two injections of 5 c.cm. each were given the second five days, and three a day during the third period of five days. The remedy was then stopped for five days, after which the same treatment as the first period of fifteen days was resumed, and continued as before for another period of fifteen days. The pa-

tients were aged eight, twelve and fourteen years, and the cure was permanent.

Other cases have been reported, such as tuberculosis, leukemia, and Basedow's disease, and in all the remedy was well tolerated. Renaut in Rev. de Therap, describes the use of sodium cacodylate in a case of epithelioma of the tongue, which had existed for some years. The patient was greatly improved by taking the remedy in pills of 0.05 gm. ($\frac{3}{4}$ gr.) each, one to five pills per day. The treatment was kept up for eighteen months alternating treatment of months' intervals.

Gautier condemns the giving of sodium cacodylate by either mouth or rectum, stating that the remedy was either inactive or harmful when so administered. He claims that its application externally or its use hypodermically was necessary in order to avoid poisonous effects as the remedy was decidedly unstable and easily converted into an extremely poisonous substance, which was quickly absorbed from the gastro-intestinal tract and gave rise to diarrhea, pain, intestinal disturbance, albuminuria, loss of weight and general fatigue.

Grasset La Sein. Med. does not agree with this estimate, and claims rather that the reme-

dy was well borne when administered internally, and that the alliaceous odor did not exist when it was so given. He then details thirteen cases of his own, some of chorea, one of exophthalmic goiter, four of tuberculosis, etc., in all of which there was increase of weight and appetite. Grasset gave the remedy in doses of 0.02-0.05 gm. ($^1/_3$-$^3/_4$ gr.), one dose daily, and used it every alternate period of ten days. He further states that one case took by mistake 0.5 gm. (8 gr.) a day for three days without bad results.

SOMATOSE, FERRO-SOMATOSE, LACTO-SOMATOSE.

These three preparations are the outcome of physiological experiments which showed that a large proportion of the albuminous elements ingested with the food are absorbed in the form of albumoses, without undergoing the final change into peptones.

Somatose consists of the albumins of beef, which have been converted into albumoses, and is claimed to contain only a trace of peptones. The objections which have been especially urged against the use of peptones as

food preparations are their bitter disagreeable taste, their tendency to produce gastro-intestinal disturbances, as well as their comparatively low nutritive value. Somatose was originally brought out as a food preparation, but later reports have shown it of equal value as a tonic and stomachic, increasing the appetite and regulating the digestive functions. Its property of increasing the secretion of milk in cases of deficient lactation has been confirmed by later investigations, although it is not yet known whether this effect is due to the general tonic influence of somatose upon the system or to a specific action upon the mammary glands, as has been maintained by Drews, of Hamburg, and others. An experimental study of this preparation by Thomas Stevenson and A. P. Luff (Lancet) demonstrates that somatose has a favorable effect upon the general metabolism, that it is free from any irritant effect upon the kidneys, and never gives rise to albuminuria, albumosuria, or peptonuria. Attention has been directed to its value in the cachexia of syphilis.

Ferro-Somatose is a chemical combination of somatose with iron, and is claimed to combine the nutrient and tonic properties of the

former with the special qualities of the latter. Recent reports would seem to show that ferro-somatose is a valuable addition to chalybeate therapy, since it is free from irritating action upon the digestive apparatus and is readily absorbed and assimilated. The absorbability of this preparation has been made the subject of a special investigation by W. Nathan, who in experiments on mice found that after several days' administration of ferro-somatose there was considerable accumulation of iron in the central lymphatics of the villi of the small intestine, as evidenced by a greenish discoloration, and the presence of distinct iron granules. One of the most notable of recent contributions on ferro-somatose is on its use in the anemia pseudoleukemia of children, which closely resembles the ordinary leukemia, but generally terminating in recovery. In this affection the preparation improves the condition of the blood, as shown by blood counts.

Lacto-Somatose, which consists of the albumoses derived from milk, with a small percentage of tannic acid, has not yet attained any degree of popularity, although it has recently been highly recommended by I. J. Jones (New

York Medical Journal) who employed it in twenty-five cases during an epidemic of infantile diarrhea. In some instances it constituted the sole diet for a number of days, but usually it was given in addition to other food. Its action was to check the diarrhea and regulate the gastro-intestinal functions.

SOZOIDOL.

(Di-iodo-para-phenol-sulphonic acid.)

$C_3H_2I_2(OH)SO_3H. + 3H_2O.$

Sozoidol is a combination of 52.8 per cent iodin; 7 per cent sulphur, and a proportionate amount of carbolic acid. Supplied in the form of salts, with potassium, sodium, mercury, zinc, etc., the potassium (soluble in 50 parts water) and the sodium (soluble in 15 parts water) salts being usually employed.

An odorless antiseptic, disinfectant, and an iodoform substitute. Employed in 5 to 20 per cent solutions, ointments, etc. Extensively reported on by good authorities, in the treatment of skin diseases, such as herpes, in impetigo (Lassar), in otitis, rhinitis, etc., (Lassar, Koch), and in gynecology (Nitschmann), mostly favorable, and been in continued, though limited, use for a dozen years.

STYPTICIN.

(Cotarnin hydrochlorate.)

$C_{12}.H_{13}.NO_3.H_{20}.HCL.$

Stypticin is a yellow crystal freely soluble in water and alcohol. It is obtained by oxidizing the opium alkaloid narcotin. Is hemostatic and analgesic and is used for controlling uterine hemorrhages, from whatever cause. It is said to be somewhat analgesic and is given in doses of 0.1-0.2 gm. (1½-3 gr.), as needed. Authorities differ as to the action of stypticin upon the respiratory centre, some claiming that it has a paralyzing effect, while others are equally positive that it has a tonic effect upon the circulatory system.

Stypticin may be used in urgent cases by injection ½ grain in 10 per cent solution. It may also be applied pure or on cotton in dental hemorrhages.

SULFONAL.

(Di ethyl-sulfon-dimethyl methane.)

$(CH_3)_2C(SO_2C_2H_5)_2.$

Sulfonal occurs in colorless crystals, which melt at 125 deg. C. (257 deg. F.); is very slightly soluble in cold water, but soluble in 15 parts of boiling water.

Owing to the slowness of the action of sulfonal it is especially indicated in cases of insomnia in which, after sleeping for several hours, the patient awakes and is unable to obtain any further sleep; hence, when administered at bedtime its effect will not manifest itself until just about the time the patient ordinarily awakens. While trional is indicated in cases in which the patient is unable to sleep from the first, and here its promptness of action is a decided advantage.

Sulfonal is still occasionally mentioned in the literature, the various affections referred to being, especially, simple insomnia, mental diseases, insanity, chronic morphinism, and alcoholism.

Unpleasant after-effects, symptoms of poisoning, and occasionally fatal results followed its use in a number of cases reported from time to time. It can, however, be said that if sulfonal is used with care, and under the supervision of the physician, it is generally safe and to be depended upon to produce sleep. It has a cumulative action and, therefore, its administration should be frequently intercepted and saline cathartics administered to cleanse the intestinal canal. The kidneys should be care-

fully watched, and if the urine becomes scanty or colored a reddish brown sulfonal should be discontinued and diuretics administered.

Dose, 1.0-2.0 gm. (15-30 grs.)

TANALBIN.

(Tannin Albuminate.)

A reddish brown powder made by adding ten parts of a 10 per cent solution of albumin to six and one-half parts of a 10 per cent solution of tannin. A precipitate forms which is to be washed and dried with heat at 30 deg. C. It consists of about half its weight in tannin, is insoluble in water; is tasteless and odorless. It is used as an astringent in intestinal troubles, but its action is very feeble. It is said not to disturb the digestion and has been used in chronic diarrhea, intestinal catarrh and in intestinal ulceration; is also spoken of in the treatment of gastric catarrh.

Dose, 1.0-2.0 gm. (15-30 gr.) 1 time to six times in twenty-four hours.

TANNIGEN.

(Diacetyl Tannin.)

$C_{14}H_8(COCH_3)_2O_9$.

Tannigen is an acetic ester of tannic acid.

It is a yellowish, gray, odorless, tasteless and hygroscopic powder, insoluble in water, sparingly so in ether, but freely so in alcohol. It is decomposed by alkalies, and its solution turned bluish black by addition of ferric chlorid.

Tannigen was introduced several years ago as a preparation of tannic acid which is not acted upon in the stomach, but is decomposed in the intestinal canal, where it exerts its astringent effect, especially at places where the secretion is most alkaline. The general indications for this remedy are catarrhal processes in the large intestine, especially of subacute or chronic character, while it is less efficient in inflammation of the small intestine, especially acute enteritis. According to Ewald it is an excellent remedy in the intestinal catarrhs of infants and young children, after the use of evacuants, such as calomel or castor oil.

TANNOPIN.

(Tannon.)

$(CH_2)_6N_4.(C_{14}H_{10}O_9)_3.$

Tannopin is a condensation product of

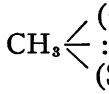
tannin and urotropin. It is represented to consist of 87 per cent of tannin and urotropin 13 per cent. It is a light brown hygroscopic powder, tasteless, insoluble in water, weak acids, alcohol and ether, but soluble in alkaline fluids.

Tannopin possesses certain advantages over tannigen. Like the latter remedy it passes undecomposed through the stomach, and is slowly split up in the alkaline intestinal fluids, but this decomposition is much slower than in the case of tannigen, so that the effect of the drug is diffused over the entire intestinal tract. Aside from this, the hexamethylen tetramin (urotropin) also contributes to its efficiency, since this substance has been shown to be possessed of disinfectant properties. From the literature thus far published it appears that tannopin is a promising remedy in cases of acute and chronic intestinal catarrhs, cholera infantum, and intestinal tuberculosis.

Dose 1.0 gm. for adults, 0.2-0.5 gm. (3-7½ gr.) for children.

THIOCOL.

(Potassium guaiacol sulphonate.)



Thiocol contains about 60 per cent of guaiacol, is a fine white powder with a slightly bitter taste at first, followed by a sweetish taste. It is soluble in water and claimed non-irritating to the mucous membrane.

Used in the treatment of tuberculosis, chronic bronchitis and intestinal catarrh. Given in powder, tablet or solution, in doses of 1.0-4.0 gm. (15-60 gr.) per day, divided into 3 equal parts and taken after meals.

THIOL.

A synthetic product of hydro-carbons, chemically and therapeutically identical with ichthyol, having the advantage over the latter of being odorless. Thiol is supplied in liquid and powder form, the former being equal to 40 per cent of equal bulk of powder.

Introduced in 1888 by Jacobson as a substitute for ichthyol, for use in dermatological practice, many favorable reports

have been published by good authorities (Reeps, Buzzi, Bidder, Schwimmer, Gottschalk, McLaughlin, Wirz, etc.), and it is undoubtedly in extensive use, yet it has not materially affected the greater popularity of its evil-smelling prototype.

It has proved useful in cutaneous affections of great variety, in furnucles and carbuncles, in burns, in rheumatic inflammations, and in gynecological practice.

Applied in 5 to 20 per cent aqueous or glycerin solutions, ointments, paste, collodion, etc.; in 1 per cent injections; with talcum as 3 per cent dusting powder; internally in 0.032-0.130 gm. ($\frac{1}{2}$-2 gr.) doses in wine, milk, chocolate, or in pills or capsules.

TRICHLORACETIC ACID.

CCl_3COON.

Trichloracetic acid is obtained by the action of chlorin on glacial acetic acid, and occurs in colorless hygroscopic crystals, with a penetrating odor; is soluble in water and alcohol. It is used as a caustic, and reports have been obtained from Urner, Sigmund, Lanz and

Dumas favorable to its action on papilloma; a small crystal applied, producing a scurf, which is dropped in a few days and followed by rapid healing. The pain is slight. Vascular nevi are also thus destroyed. It is recommended by Lanz for gleet in a 20 per cent solution. Trichloracetic acid is also used as a test for albumin.

TRICRESOL.

Tricresol is a purified mixture of meta, ortho and paracresols, occurring as a clear, colorless liquid, with a cresote-like odor; soluble in about 2½ parts of water.

A disinfectant, used as 1 per cent solution in wounds; said to be three times the strength of carbolic acid. Used extensively in the United States by the Army and Navy surgeons, but otherwise not as popular as its value would seem to justify.

Charteris, Reed and others assert that tricresol is a very active germicide. It may be used wherever carbolic acid is employed and affects the skin much less than does carbolic acid; it is not as irritating to wounds as is carbolic acid or bichlorid mercury. It does not affect surgical instruments.

TRIONAL.

(Di-ethyl-sulfon-methyl-ethyl-methane.)

$C_2H_5CH_3C.(SO_2C_2H_5)_2$.

Trional is closely related to sulfonal, differing only in the substitution of a methyl by an ethyl group.

It occurs in colorless shining crystals sparingly soluble in cold water, but freely so in hot water, in alcohol and in ether. It melts at 76 deg. C. (168.8 deg. F.)

Among the modern hypnotics trional is perhaps the most prominent in America, although the English still cling to sulfonal. The points especially emphasized by recent writers in favor of trional are its promptness of action and comparative freedom from after-effects. Aside from its general use as a hypnotic it has been found of service in the treatment of epilepsy, to which attention was first directed in a report from S. Weir Mitchell's Clinic. H. S. Upson states that aside from the bromides trional is the best of the few drugs which deserve mention in epilepsy. It is his custom to administer it in 0.2-0.3 gm. (3-4 gr.) doses, 3 to 4 times daily, reducing this if the patient becomes sleepy. Under its use the

attacks were arrested without the occurrence of any unpleasant effects.

Chorea is another affection in which trional has lately been resorted to with very encouraging results. It is especially valuable in cases where the movements are so violent as to prevent sleep. It may be given in 0.130 gm. (2 gr.) doses every 4 hours to a child of about 10 years of age, as recommended by A. H. Adams. This author states that trional and sulfonal are next in importance to Fowler's solution, and superior to the bromides and strychnia.

Puerperal insanity is also a promising field for the use of trional. It has maintained its place in the management of cases of chronic morphinism. In cases of nervous insomnia, as in neurasthenia, trional is efficient, but in sleeplessness resulting from mental diseases it is less successful. In delirium tremens it still retains its position as one of the favorite hypnotics.

TUMENOL.

Tumenol-Sulphonic Acid.

Tumenol is derived from a bituminous mineral obtained from a mine near Darmstadt,

by dry distillation, the resulting product subjected to the action of dilute sulphuric acid and alkalis, thus removing the creosotes and all acid bodies and bases. A dark colored substance having the consistency of syrup results, which is a mixture of sulphone and sulphonic acid. This when washed with water and a solution of common salt, forms tumenol. There are three forms to be had: The paste, the oil and the powder. The paste is the original product. From this the oil is prepared by separating the sulphone from the sulphonic acid. This sulphone or oil is a thick oily substance having a dark yellow color, which is freely soluble in ether and benzol. The tumenol powder results from the aqueous solution of the sulphonic acid, after the sulphone has been extracted, being entirely freed from water. This powder is freely soluble in water.

The tumenol products have the remarkable property of reducing the per-salts of iron to the proto-salts, permanganate of potassium to an oxid, and bichlorid of mercury to calomel. The oil will reduce a quantity of sulphuric acid, sulphurous gas being evolved.

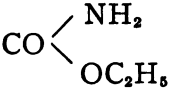
If it is a fact, as claimed, that the properties

of remedial agents used in the treatment of skin disease, depends largely upon the property of abstracting oxygen from superficial layers of the skin, thus rendering it an unsuitable soil for the life or development of micro-organisms, then the action of tumenol will be understood.

Chronic or sub-acute eczematous conditions are greatly benefited by the application of tumenol; in all such cases accompanied with itching, in dermatitis due to parasites, in prurigo, pruritis and fissure of the anus, as well as a dressing for ulcerations not too moist, or purulent, or when there is not a great loss of tissue, its effects will be quickly apparent and of a satisfactory character.

URETHANE.

(Ethyl-urethane.)



Urethane is a compound of ethyl ether and carbamid acid, made by heating urea nitrate with alcohol. It occurs as colorless crystals, having a slight odor of ether and a salty taste; is soluble in water and alcohol.

Urethane is used as a hypnotic, but reports differ very materially; one set of clinicians (Stricker, Myrtal, Kraepelin, etc.,) claiming favorable results; while others (Bock, Koenig, etc.) condemn it. Urethane has no analgesic or pain-quieting effect. One case of traumatic tetanus, successfully treated after chloral had been unsuccessful, has been reported by Jackman in the Lancet, June, 1886.

Dose 2.0-3.0 gm. (30 to 45 grains).

URICEDIN.

Uricedin is said to be prepared from lime or lemon juice by first clarifying the solution, determining the quantity of citric acid present, then treating with c.p. sulphuric acid, and neutralizing with sodium sulphate, drying and granulating. The composition as given by the manufacturer is as follows:

Sodium citrate	53.75 parts
Sodium sulphate	38.55 parts
Sodium chlorate	1.77 parts
Sodium acetate	1.43 parts
Sodium tartrate	1.19 parts
Sodium pomate	1.21 parts
Sodium pectinate	1.17 parts
Limonin	0.11 parts
Extractive matter	0.82 parts

The evident fact that uricedin is a mixture of the several salts of sodium, and the excessive price at which it is offered has restricted its use and allowed a similar product to be placed upon the market at less than half the price.

In consulting medical literature reports are found from Finkelstein Progressal Medical Roman, Kortum Aerztlicher Central-Anzeiger, Fassano Archivo inter-Nationale di Medicina and Chirurgia, Holtz Allgemeine med. Central-Zeitung, Mendelsohn Deutsche med. Zeitung, Langstein Prager med. Wochenschrift, Stern New York Med. Record, Craig Journal A. M. Association, Franghiadi Kansas City Lancet, Wile New York Lancet, Rouse American Therapist, etc.

The trend of the reports is favorable to the action of the product in gout, chronic rheumatoid arthritis, sciatica, occipital headaches, migrain, hay fever, asthma, etc., in doses of 1.0-4.0 gm. (15-60 grains) three times a day, given preferably in hot water. The action is reported to be always laxative and occasionally cathartic. This in itself is favorable to relief in the above complaints.

UROTROPIN.

(Hexa-methylene-tetramin.)

$$-(CH_2)_6N_4.$$

Urotropin is one of the most successful of recently introduced new remedies, and hence has been subjected to the doubtful compliment of numerous imitations.

A chemical compound of formaldehyd and ammonia; occurs in colorless, transparent prisms, very soluble in water, with a sweetish taste, but leaving a somewhat bitter aftertaste.

A urinary antiseptic, of which it is said that "it is efficient, rapidly rendering alkaline and putrid urines—containing mucus, pus, and excessive quantities of uric acid and urates—normal in appearance and reaction. It sterilizes the urine and increases its quantity."

The dose is about 0.5 gm. (7½ gr.), three times daily, best administered in half a pint of plain or carbonated water.

Few, if any, new remedies have been so widely tested and favorably reported on by authorities in Europe and America, including notable contributions by Barder, Nicolaier, Casper, Mendelsohn, Klotz, McKee, Wilcox,

Richardson, Flexner, Kelly, Horwitz, Cumston, Whittaker, Greene, and many others.

It is to be borne in mind that in order to have urotropin decomposed, and to secure the antiseptic effects of formaldehyd, it is necessary to have an acid urine. In pyelitis and cystitis good effects are numerously reported from urotropin, as well as in phosphaturia, but it is not superior to piperazin as a uric acid solvent, nor is it of value in the treatment of renal or vesical calculi. In the so-called uric acid diathesis, however, it is useful as a substitute for the salicylates.

If urotropin is taken for several days in large doses, 7.0-8.0 gm. (1½-2 dr.) per day, there will be smarting or burning pain in the bladder and urethra after urination particularly, and if it be further continued a urinary sediment containing blood and epithelium will ensue. It has been reported that albuminuria and renal irritation have followed the use of urotropin even in rare cases where only a moderate dose has been given (H. C. Wood).

VASOGEN.

Although employed by Prof. Bayer for

some years, this preparation was only recently introduced into general practice. It is an oxygenated vaselin, although another statement is that it contains about 25 per cent of olein, saponified with anhydrous ammonia and mixed with vaselin and brought to suitable consistency with vaselin oil. In appearance it resembles the liquid vaselines but differs from them in emulsifying with water, in solvency for many drugs and in its marked absorbability. As an inunction-vehicle it possesses the following great advantages over the ordinary ointment bases: It penetrates easily into the deeper layers of the skin; it does not discolor, harden or "gum" the skin; it is not irritating; it is easily removed from the skin, although after application with even moderate massage there is but little left to remove. Commercially it occurs as liquid vasogen (which thickens on exposure to cold, but readily liquefies again on warming); as solid vasogen; and as a vehicle for various drugs mixed with, or dissolved in it.

Thus the following preparations are made by dissolving the medicaments in the liquid vasogen as it is in process of manufacture: Iodin vasogen, 6 and 10 per cent; menthol vasogen,

2 per cent; iodoform vasogen, 3 per cent; sulphur vasogen, 10 per cent; guaiacol vasogen, 20 per cent, etc. Many vasogen preparations have found a range of usefulness wider than that of the older preparations. Iodin vasogen is superior to tincture of iodin in many respects—it is non-irritant superficially, colorless, and penetrates deeply. It produces favorable local action in epididymitis, lymphadenitis, periostitis, scrofuloderm associated with lupus, etc. Friedlander reports favorably on iodin vasogen used internally as a substitute for iodin salts and for cod-liver oil.

It has been employed in the treatment of goitre, syphilis, arteriosclerosis (Kleist), pleurisy, bronchitis, etc., in doses of 0.3-2.0 c.cm. (5-30 drops) (of the 6 per cent iodin vasogen) t. i. d. in milk, tea or coffee. Per os and per rectum creosote vasogen has yielded encouraging results in asthma, pertussis, phthisis and bronchitis. Iodoform vasogen, in which the iodoform is held in solution, has been used in surgery both as a wound application, and hypodermatically in the treatment of tumors by injection. Mercury vasogen is more rapidly inuncted than the official ointment, it leaves but slight trace on the skin and does not dis-

color the clothing. Its rapid absorption is demonstrated by the prompt appearance of stomatitis when the dose is not carefully limited, and by the early excretion of mercury in the urine. Mercury vasogen, iodin vasogen, tar vasogen, etc., have yielded satisfactory results in the treatment of eczema, psoriasis, scabies and a number of other skin diseases, in Austrian and German clinics (Ullmann, Senator, Kleist, Lestikow), and also as reported by Pinilla (Madrid), and Humphrey (Henderson, Ky.).

XEROFORM.

(It is the tribromphenolate of bismuth.)

$(C_6H_2Br_3O)_2BiOH+Bi_2O_3$

Xeroform is one of the several compounds introduced as substitutes for iodoform, containing 50 per cent of bismuth oxid in chemical combination with 50 per cent of tribromphenol. It is a yellowish-green, neutral, impalpable powder—tasteless, almost odorless, said to be nonirritating, noncaustic and non toxic; also a deodorant and astringent. It is insoluble in water, alcohol, vegetable oils, fluid

vaselin or chloroform, but is soluble in 2 per cent solution of hydrochloric acid in the proportion of 30:100. With alkalies it forms bromides.

Clinical and laboratory experiments show this drug to be strongly antiseptic. It inhibits bacterial growth and is a fairly stable compound, readily decomposing in contact with intestinal—or wound—secretions into bismuth oxide and tribromphenol. The former forms insoluble compounds with ptomaines and toxines, and the latter is bactericidal. The antiseptic action of xeroform seems to be local.

It has been used as a local antiseptic in a variety of wound conditions, skin and eye-lesions, and intestinal intoxications. After aseptic operations it may be used as a dusting powder over the wound, or as a gauze in the strength of 5 per cent to 10 per cent. Applied to ulcers or to suppurating wounds, it diminishes the pus-secretion, deodorizes the fetid discharges, inhibits the growth of flabby granulations, and by mild irritant action promotes the development of firm granulation tissue. It must be applied directly to the wound surface, freed from all crusts. Al-

though it may be safely dusted on liberally, it is used to best advantage when applied in a thin layer. It hastens cicatrization and encourages the growth of epithelium over indolent ulcers.

It has been used as a topical application in a variety of venereal conditions—chancre, chancroid and suppurating bubo. Being a fine powder, it may be insufflated into branching sinuses or tooth-root cavities. It has been used in the treatment of moist eczema, impetigo and other dermal lesions. Xeroform may be administered in wafers or capsules, but better in mucilage or in emulsion in typhoid fever, intestinal tuberculosis and other conditions depending upon the action of bacteria in the intestinal canal.

The dose is 0.5 gm. (7½ gr.), which can be repeated several times a day.

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